How to Apply Research to Improve Music Teaching from A to Z†

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A goal of many music education organizations around the world that support research journals is the dissemination of research so that it can be applied in the music classroom (Britton, 2010; Burnhard & Spruce, 2010; “Take note,” 2010; Tsubono, 2010). Most music education researchers believe that a great deal of their work has immediate and direct applicability within the classroom. However, many practitioners and some researchers claim that research articles are often difficult to read which makes their contributions difficult to apply in the music classroom. This paper provides strategies for the practitioner to extract the important results of research, to relate these findings to the teaching/learning situation, and to apply the knowledge in the music classroom.

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Bringing Research to Practice

While most educators support the translation of research into practice, it seems to be an exceedingly difficult task to accomplish (Gersten, Vaught, & Deshler, 1997, p. 466). Research has shown that the sustained use of research-based strategies is not assured even when the strategies have been shown to be effective. Johnson (1990) suggests that this might be due to the research not meshing with the teacher's own experience. Johnson contends that the adoption of research-based strategies is dependent upon teacher attitude. Lei (2008) further refines attitude as research self-efficacy, the confidence teachers have about understanding research. It is research self-efficacy that is the prime determinant of whether a teacher will apply research-based strategies.

Teachers frequently perceive that research is not applicable to their school situations (Griffin & Barnes, p. 572). That is because teachers perceive the world in very practical terms and tend to focus specifically on what influences learning in their particular classroom. Gersten, Vaught, and Deshler (1997, p. 468) point out that the key features for a research-based teaching strategy to be adopted are “practicality, concreteness, and specificity.” Another detractor is that the language used by researchers is far removed from that of teachers (Merrion, 1990; Snell, 2003). Snell (2003) says that teachers may contribute to the research-practice gap by

(a) ignoring what research says; (b) failing to understand what research says; (c) searching for quick fixes; (d) selecting interventions based on the conformity criterion; (e) looking only on the internet for solutions; (f) using an intervention but giving up prematurely; and (g) changing a proven intervention so that it is vastly different. (p. 143)

Researchers also contribute to the difficulty in bringing research-based teaching strategies into the classroom. Snell (2003) comments:

Researchers, regardless of the research methods they use, may contribute by: (a) addressing topics that are simpler versions or real school problems; (b) discovering useful findings but neglecting to share them beyond an academic audience; (c) failing to identify the practical implications of their findings for

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 educators; and (d) applying their interventions only to "select" groups (e.g. students not on medication or with no problem behavior). (p. 144)

It is our opinion that these problems would be much less of an issue if there were a readily available set of procedures that could be applied by the practicing music educator to bring research into practice. These procedures require that the user is a reflective individual who is able to build on existing knowledge, acquire new knowledge, and evaluate the appropriateness of research-based teaching strategies to their own unique music teaching/learning situations.

Research and the Scientific Method

Philosophy of science. The primary purpose of science is to uncover truth through observation in order to provide predictions about future events (Popper, 1959). Science is about explaining how things work. Through analysis, we can break down observations into simpler concepts to better understand a phenomenon. Through inductive (bottom-up) or deductive (top-down) reasoning, explanations of how things work (theory) can be developed, and information gathered (data) can be used to confirm or disprove the theory. In addition to data and theory, other principles may also be in play, such as the law of parsimony (i.e., Occam's Razor), which states that all other things being equal, the simplest theory is usually the best one.

Empiricism. Empiricism holds that the foundation of all knowledge is received through the senses (Stubley, 1992, p. 4). Empiricism attempts to avoid any involvement of beliefs or innate ideas to focus on the objective understanding of what is sensed (Elliott, 2002, p. 88). It is from empiricism that the scientific method evolved where hypotheses are tested against observations of the natural world. Such systems of observation are known as experiments.

Convergence. A desire of scientific knowledge is that there is convergence in the results of different studies on the same scientific topic. That is, the results from various studies support the same conclusion. Convergence happens in music education research when a number of studies whose focuses are on some aspect of the same concept draw similar conclusions. Because there are a number of studies that show the same conclusions, we can have fairly good assurance that the conclusions drawn are accurate and that our knowledge about the concept is correct.

Objectivity and ethics. The goal for science is to determine information independent of a person’s own opinions in an objective way as possible. That is, to eliminate bias. But as Woody Allen (1975) says in his movie, Love & Death, “Objectivity is subjective.” The best that we can hope for is to try to eliminate as much bias as possible, keeping in mind that we all have our own predilections and biases. This is done through objective assessment that is supposedly bias-free, or through qualitative observation, taking bias into account during the interpretation of an observation. In both cases, truth is the goal. In quantitative research, bias is removed before observation, resulting in as bias-free a result as possible, while in qualitative research, bias cannot be eliminated, but is recognized as part of the interpretation of the observation taking place.
Strategies for Applying Research in the Classroom

Developing the Question

The first step to apply research in the music classroom is to have a clear concept of exactly what is the music teaching/learning need (Figure 1). This, by the way, is not a trivial issue. The clearer the concept, the easier it will be to locate, evaluate, and apply a music teaching/learning strategy. One means of helping clarify the concept is to develop a clearly worded question. This question is actually a formal statement of the goals for enhancing the teaching/learning environment (Marion, 2004).

It is sometimes easier to begin with a statement that describes the purpose for the teaching/learning strategy. Included in the purpose statement should be an indication of the need for the strategy. The purpose statement should also include any characteristics of the music teaching/learning environment that might directly impact the effectiveness of a strategy. For instance, incorporating information that the strategy must be appropriate for children with a certain special need would have a significant impact on the type of strategy that might be applicable.

A research question extracted from a purpose statement should be a very clear and concise synthesis of the purpose statement that will guide all future work to bring the strategy from the research domain into the teaching domain. The relevant features characterized in the purpose statement that would impact teaching strategy selection should be incorporated into the research question. From this point forward, the question will guide all activities associated with finding and implementing the teaching strategy.

Identifying Research

Today we are indeed fortunate to have the Internet with its world wide web. This system makes available a multitude of means for identifying research that specifically meets the needs defined by the question. For instance, one of the authors of this paper has an on-line search system for music education publications of the United States that currently has 19,624 entries in it (Asmus, 2010b). Most of these entries are research-based and the system is freely available to anyone. There are also many other commercial search systems and those provided by professional organizations. Universities often make such systems available to their constituencies so that through one university you can search from anywhere in the world.

Pre-planning what terms will best identify the most relevant research is a useful first step in performing a search. A list of keywords can be made directly from the question. The narrower the key terms, the fewer number of articles will be identified. Because so many articles have been written in the area of music education and in the broader field of education, it is often best to first identify a focused list of terms and then identify a broader list of terms. Use the focused list of terms first. If you are not finding the research you need to answer your question, expand your search using the broader list of terms.

The on-line information available today is very impressive. Once you have identified the research articles that seem to be relevant to your question, see if the articles themselves are on-line. This can be done in a number of ways. One method is to simply put the name of the publication into one of the major search engines like Google, Yahoo, or Bing. Some publications make available their past articles on-line through their websites. If this is not successful and the professional organization that sponsors a particular publication is known, go to that organization’s website and determine if they make the articles available on-line. Another strategy is to go to a university’s library website and see if the article is available through the resources of the library. Frequently, universities will make their holdings available to community members—especially teachers.

The retrieved on-line articles should be saved appropriately so that they can be accessed and read when necessary. There are software systems that can help with this, but that is a topic beyond the scope of this paper. It is very important to save the articles using a consistent approach that allows one to find the article easily at a later date. One tool that might be useful is to make a catalog of all the files by putting their location immediately after the articles reference that was identified as part of the search process. It never ceases to amaze the authors of this paper that what seems like a perfectly logical and meaningful filename one day, is meaningless a few days later.
Purposeful Research Reading

Reading research with a purpose is the hallmark of someone who is truly looking to apply research in his or her teaching. The reason for reading the research has been defined by the question and the purpose statement. Prior to beginning reading an identified source, make certain to reread the question to assure that you are focused on exactly what you are trying to accomplish. At the 28th World Conference of the International Society for Music Education we presented a strategy for reading research articles (Asmus & Zdzinski, 2008). This strategy is immediately applicable in this situation. We suggest that the relevance of the identified research article can be determined quickly by reading the following sections of the article: the abstract, the introduction, and the conclusions.

The abstract. The abstract provides an overview of the research. A well-written abstract provides all the reader needs to determine if the article deserves further scrutiny. After reading the abstract, the reader should determine if the substance of the article is relevant to the question that has been defined. If the article is indeed relevant, then further reading of the article should occur. If not, the article can be put aside and the reader can move to the next identified article.

The introduction. The introduction of a research article will introduce the reader to the problem, provide some background to the problem, and detail a problem statement. The introduction section is logically at the very beginning of the research article. This information further clarifies to the reader whether this research is applicable to the defined question. It also gives a basis for understanding why the research was undertaken and the exact purpose of the research. Often the statement of the problem will be in the form of research hypotheses or research questions. More than any other content of the research article, this will determine the relevance of the research to the defined question.

The conclusions. At the very end of the article will be a section that describes the conclusions that the researcher has made about the research study. This is usually the last two or three paragraphs of the article. The researcher usually draws conclusions about the original problems posed in the introduction. The conclusions also point out how the findings are applicable within the music classroom. The author will draw together other research and how the present findings relate to those of previous research related to the subject. The conclusion section provides the necessary material for establishing the strategy that the reader would like to apply in the music teaching setting. If the conclusion does not provide the reader with the necessary detail that is desired, the reader can go back to the method section of the article to gain further insights that clarify the teaching strategy.

While this is a short-cut approach to reading a research article, it is most appropriate for our purpose: bringing research into practice. Our question will always provide the basis for determining relevance to our music teaching/learning situation. It is from the question that we can determine if the teaching strategy derived from the research will be useful for our purposes. It is necessary to have a purposeful approach to reading research so that we can stay focused on our goals defined by the question. We are doing the reading to improve teaching and learning. While we might find interesting approaches that can be applied in other situations, we must remain true to our goal established in the question.

Determining Research Quality

It is important for a reader to have a grasp of some of the primary concepts for establishing the quality of research read. Understanding research quality allows the reader to further determine the appropriateness of the strategy for reaching the goals set out by the defined question. There are four primary issues: validity, replicability, accuracy, and objectivity. While reading or after reading, these factors can be weighed to determine research quality.

Validity. Validity is the most important criterion for evaluating the quality of a research article. Validity refers to the evidence that the research has been planned, conducted, analyzed, and interpreted in a manner appropriate to the goals of the research project. One of this paper’s authors (Asmus, 2010a, p. 138) has shown that there are five primary forms of evidence to determine the validity of research to the music teaching situation:

1. Content: Does the content focus of the research match that of the question?
2. Construct: What are the concepts that the research is actually requiring students to know and to do, and are these relevant to the question?
3. Criterion: Are the research results measured in a manner that relates to some external indicator of the learning that is the focus of the research?
4. Consequences: What are the positive and negative consequences of the research?
5. Practicality: Is it practical to use the researched strategy in meeting the goals of the question?

Replicability. A goal of every research report should be to provide enough information so that anyone who is interested can replicate the study. Replication is important in the research arena because it establishes if others can use the technique being studied with the same results. If it is not possible for others to produce the same results, the particular strategy being researched is valueless. Why would one want to use something that you cannot be assured of the outcomes it produces?

Replicability can be determined from the description of the research. Are there a sufficient number of people being studied by the research? Are the people being studied comparable to the people that will be taught? Are the methods stated clearly and sufficiently so that I could repeat the research? These are fundamental questions that can be used to determine the replicability of a research study. If the reader determines that the research could be replicated, then the research should be considered further.

Accuracy. A research study’s methods should all be geared to produce clear accurate results that are directly focused on the information required by the research problem. In addition, the analyses of any collected information must be appropriate to that information and provide the most accurate analysis possible. A study that uses judges, for example, should establish that the judges are indeed capable of making the judgments required and that there has been sufficient practice to assure that the judges
can rate what they are observing accurately and consistently. A research article that does not show that it went to extreme lengths to assure accuracy should be discarded.

Objectivity. A goal of any scientific inquiry is to be objective. This is to avoid any biasing based on beliefs or traditions that might lead to an erroneous interpretation of the results. A research article that is simply based on the researchers opinion of what happened is simply not objective research. Excellent research goes to great lengths to assure that there is objectivity in how the data is collected, how it is analyzed, and how it is interpreted. If a research article is to be valid, replicable, and accurate, it must be objective.

Establishing Applicability of the Research

It is most important that the research being considered is applicable to the particular music teaching/learning situation. If it is not, one cannot be assured that the strategy will work. All teaching/learning situations are unique, but fortunately people tend to react similarly to a wide variety of situations and minor modifications can be made to the strategy so that it can be adapted to our particular teaching/learning situation.

A key factor in determining the applicability of the research is the population or group of people that were used in the study. In general, the larger the number of people studied, or sample size, the wider the applicability of the findings. Similarly, the more diverse the people studied, the wider the applicability of the research. A study of small sample size can be valuable if the researcher is using a sufficient number of controls to produce very accurate results. Certainly, the more commonality there is between the population that was studied and the music teaching/learning environment, the greater the probability that the research results will be applicable to the teaching/learning environment.

Another factor in applicability is how robust the findings are. Robust findings are those that you are assured are valid, replicable, accurate, and objective. Without a doubt, robust results obtained by the research can be trusted as real and as significant. That is, the research found that there were dramatic results directly attributable to the intervention being studied. The greater certainty we have that the results will surely recur with another application of a strategy, the more confident we can be that the strategy will work in our music teaching/learning situation.

Implementing the Research-Based Teaching Strategy

Bringing a research-based teaching strategy into the classroom is one of the joys of a thoughtful educator. Consider that the educator has identified a specific need through the guiding question, worked diligently to identify appropriate research, obtained the research, and then read it thoughtfully. This is real dedication to the enhancement of education by the teacher. The research-based strategy will not be successful on its own. It must be brought together with the craft of teaching in a thoughtful manner that will maximize its potential in meeting both the students’ and the teacher’s needs. The success of the implementation will depend greatly on the expertise of the teacher in applying it appropriately within the music classroom.

The research report will provide in its conclusions quite a number of features that might be directly applicable to establishing new techniques for enhancing music teaching and learning. A list of those features should be produced. Then, the teacher considers the features that have the potential to enhance the strategies effectiveness along with the teacher’s particular classroom environment in which the strategy will be implemented to hone the implementations probability of success. It may be necessary to repeat this process a number of times until the teacher is satisfied that the strategy will succeed (Figure 2). Finally, the strategy should be reviewed in light of the defined question, the teacher’s pedagogical knowledge, the characteristics of the learner, and the environment in which the learning is to take place (Figure 3). From this, a statement describing the teaching strategy as it will be put into place should be written. We now have a research-based strategy that we can bring in to the classroom.

The teaching strategy is now brought together with the craft of teaching. As Jorgensen (2008) has shown, music teaching is both an art and a craft. She also states that we need to reflect on our own teaching practice as musician teachers, and continue...
to be a student of teaching. Certainly the steps we have followed to bring research into teaching shows us to be well placed in these two areas. The National Board for Professional Teaching Standards (NBPTS.ORG, 2010) also advocates for the continued development of accomplished teachers through practicing reflective teaching. When teachers apply their wisdom in how to actually put the research-based strategy into practice, they are enhancing their craft while enhancing the learning opportunities of students.

It is important for us to establish a systematic approach to determining if the new research-based strategy is indeed effective. Here we are involved with assessment. Like the research process itself, we should strive to implement our new strategy knowing where the students are prior to implementation and where they are after implementation. It is important that we develop the most objective methods possible to determine where students are before and after implementation. While teachers often jump to the conclusion that a test should be given in the form of a written examination, this is probably not appropriate in the majority of music teaching interventions. It is often more important to obtain objective evidence of how the students are actually performing or doing music. Observational tools that force the rater to be objective and impartial is of utmost importance to produce information that will provide the clearest picture about the effectiveness of the teaching/learning strategy. The information that is collected is then carefully scrutinized to determine if the strategy has produced desirable gains in learning. While a teacher steeped in research techniques might apply statistical procedures, this is not necessary. Often simple sums, counts, or averages might provide a clear determination of effectiveness we desire. Integrating a research-based teaching strategy into a meaningful assessment strategy such as the Assessment Development Loop (Asmus, 2010a, p. 142) provides the most promising approach to determining a strategy’s value.

Strategy Effectiveness

The effectiveness of a teaching strategy needs to be viewed more broadly than just the strategy’s effect on learning. Other factors must be considered; the more important of these are listed in Table 1. Of utmost concern, of course, is student learning. However, other factors that are well known to teachers like student attitude and time required can often be the key factors as to whether a new teaching/learning strategy will be adopted for the long term. Teachers should be aware that it is often difficult to change old teaching habits. Bringing in new strategies requires considerable effort and a distinct willingness to change existing practices. However, teachers who do make such changes are often considered master teachers by others and are those who have a great deal to offer their students and other teachers.

Table 1  
Strategy Effectiveness Factors

<table>
<thead>
<tr>
<th>Classroom Control</th>
<th>Impact on Student Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Implementation</td>
<td>Materials Required</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>Space Required</td>
</tr>
<tr>
<td>Impact on Other School Learning</td>
<td>Time Required</td>
</tr>
</tbody>
</table>

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Once an effective research-based teaching strategy has been identified, it is important to disseminate this finding to others. Conferences, teachers’ meetings, and professional gatherings are places where the attendees are hungry for new strategies that have been shown to work. Research-based strategies that have actually been proven in the classroom become very valuable commodities. Many professional journals also provide space for practicing educators to share effective strategies with others. Being research-based and tested, nearly assures that such journal submissions will be accepted.

Conclusions

If teachers trying to apply research to their teaching practice are open to new approaches and test their preconceived assumptions about teaching and learning, teacher effectiveness is an outcome. Systematically applying and testing new strategies suggested by research is a source of important information for the continued professional development of a reflective music teacher. There is a real question as to who benefits most from this process, the teacher or the student. Certainly both reap the rewards of such efforts.

A book of research-based music teaching strategies has been published (Merrion, 1989) that provides music teachers with a set of teaching suggestions that may be useful depending on the instructional context. This is a great first step, but music teachers can create their own “What Works” tailored to their own instructional contexts that provide more meaningful enhancements to their own teaching situations. We hope that in the preceding pages we have provided a set of procedures that will help do just that.

References


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