**The Identification of Fundamental Design Principles Used in the Development of Curriculum and Lesson Plans Among Music Performance Ensemble Educators**

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**Introduction**

**Design Thinking**

The concept of “Design Thinking” is outlined in a book called “The Design of Business: Why Design Thinking is the Next Competitive Advantage” by Roger Martin (2009). Martin defines *design thinking* as “analytical mastery and intuitive originality in dynamic interplay.” (p. 6) He goes on to explain that implementing *design thinking* as the process of moving along “The Knowledge Funnel” (p. 8) wherein information, product design or instructional design, or any type of innovation moves from *mysteries* to *heuristics* then to *algorithms*.

Questions, products, instruction, or other concepts begin as mysteries. With mysteries, not much is known or conceived in the minds of the creators. They are just that, mysteries, or rather questions that need answering. Mysteries are first developed by generating heuristics. Heuristics, as defined by Martin, are what others might call “rules of thumb.” Heuristics are rather intuitive truths that participants seem to know and understand. The challenge with heuristics is that they do not reliably deliver truth or results. Through experimentation with heuristics, over time, concepts become algorithms. Algorithms are repeated patterns or methods that delivery consistent results time after time.

Let us assume that we wanted to make pumpernickel bread and that a recipe does not exist. How to make pumpernickel bread, to the baker, is a mystery. However, because the baker understands some rules of thumb (heuristics) about baking bread, in general, the baker begins by mixing flour, pumpernickel seeds, salt and water and then places it in the oven. The baker can probably guess the amounts, the heat and the duration, but he/she does not know the refinements to get the results of a truly fine bread. After many tries and experiments, the baker can create a recipe. A recipe is an algorithm. The baker has defined how much flour, salt, pumpernickel, water and baking powder go into the mix. The recipe (algorithm) even defines the texture of the break after kneading and then the exact duration of baking time at a defined temperature that create the pumpernickel bread.

Once the recipe is defined, it will consistently deliver results time and time again. The baker has moved from a mystery, through heuristics, and to an algorithm. This is “the knowledge funnel,” mysteries > heuristics > algorithms. The process of moving across the knowledge funnel is *Design Thinking,* “analytical mastery and intuitive originality in dynamic interplay.” (p. 6)

The author has lived through a lot of educational trends, long enough to see ideas become the “new hot trends,” and then to only to see them wane, and then return later under a new moniker. Most “new hot” things in education are merely repackaging of concepts from twenty years ago. They are the same ideas with different titles. Because the inconsistency of the “newest best practices” that run in and out of educational circles the author favors looking for underlying principles; the parts that stay consistent regardless of the newest trends. This is why *Design Thinking* is so appealing. There are principles that are consistent, that transcend academic domains, and are inclusive of various models.

One example could be in instructional design. Probably the most known model for Instructional Designers is ADDIE. (Assessment, Design, Development, Implementation, Evaluation.) This linear type of approach, which principles are advocated by Dick, Carey & Carey in *The Systematic Design of Instruction* (2015) could be called *The Systematic Design of ?????* (Whatever we choose). Dick, Carey and Carey, offer an approach for the development of almost any product or project. In this text they outline the principles of initial assessments. In this approach, they advocate doing initial research to define the learner (audience) characteristics, the desired output, the criteria, pre-requisites, conditions and methods of delivery before proceeding towards design and development. The assessment stage operates within the “mystery” domain while appropriate questions are fleshed out to provide guidance. This is a linear model of instructional design.

Design, Development and Implementation are used as certain heuristics are assumed. All the answers towards a successful product or project are not necessarily known. Yet, underlying principles can be used as guidelines. Evaluation gives insight as to what actually works or does not work following implementation. This process can continue through several iterations until a degree of reliability is achieved. When reliability is achieved, we can then say the product or project has reached the stage of an algorithm.

**Music Performance Education**

There is an axiom in educational circles that “teachers teach as they were taught, not as they were taught to teach.” As music is a performing art, young teachers often dream of the day when they will be the conductor of a large band or orchestra and how they will provide the same experience for students that they had in their music development. In learning to perform on their instrument or voice, these teachers learned rehearsal strategies through experience for achieving performance expertise. They also observed rehearsal and teaching strategies manifest by their music conductors, directors and teachers as they sat in their performing ensembles. What was not always seen by soon-to-be instructors was the preparation and design of instruction that expert music educators put into each rehearsal and instructional period.

While principles of score study are initiated at the bachelor’s level of music educator preparation, it is not highly emphasized until the master’s degree level. Thus, without a deeper understanding of score study, inexperienced teachers step up before an ensemble and rehearse as they were rehearsed, with a goal only to the performance and they learn the score, in process, right along with the students.

Without prior score study, inexperienced instructors are unaware of opportunities for designing instruction. Experienced music performance instructors not only prepare for a rehearsal through appropriate score study, they also prepare instructional strategies at the macro and micro levels. The experienced instructor knows that the macro concepts of expression, pitch, intonation, blend and balance need to be taught at all levels and through all compositions studied throughout the year. Micro concepts such as individual formal structures, unique techniques, and theoretical constructs through each composition then need to be studied. At both the macro and the micro level, transfer of knowledge and skill needs happen from composition to composition.

Some major publications have been developed to help music performance educators develop and design instruction that benefits students beyond the next performance. Two of these landmark resources are *Blueprint for Band* by Robert Garafalo (1983) and *Teaching Music Through Performance in Band* by Miles & Blocher, et al. (2009). The *Teaching Music* series has expanded to 10 volumes for band and several other editions for choir and orchestra. Garofalo (1983) outlines the theory and principles of designing instruction for performance ensembles. Miles & Blocher (2009) follow many of the same principles and do a lot of the needed analysis and design for music educators. The *Teaching Music* series expands on Garofalo’s concepts and provides models of score analysis and instructional units (lesson plans) for music educators.

The underlying principles in the writings of Garofalo and Miles & Blocher are guided by the concept of *Comprehensive Music Education* (CME). In CME, there is much more to a selection of music than the next performance. Students need to understand the fundamental elements of all music and then see how they apply to the composition being currently studied. These fundamentals are Form, Rhythm, Melody, Harmony, Dynamics, Timbre, Texture, Technique, Expression, Text and Culture. All music functions as an interplay between these fundamental elements. When music performance educators focus on teaching these fundamental elements, the quality of performance increases from composition to composition. Without this focus, each new composition studied is something entirely new and the instructor will need to start at the beginning every time. Very little transfer occurs without an approach to comprehensive music education.

Music performance educators need to engage in the process of design thinking, taking students through the process of engaging in an unknown composition, creating, defining and testing heuristics and then developing algorithms that are reliable and relevant to the performance.

**Background**

Of interest is the work of York & Ertmer (2016). In this research, the researchers set out to identify some underlying principles in the process of design. The researchers identified 61 principles that instructional designers used in their practice, 32 of which are directly related to the ADDIE model and 29 others that were tied to principles of communication, clients and project management. Most interestingly they discovered that novice designers tended to follow models whereas experienced or expert designers looked at the models as guidelines. Through experience, these advanced designers had learned to discern what was important in a project and then pick and choose the methods that fit the needs. They had essentially built their own personal libraries of “tools” and methods to meet the needs of their clients.

It is the premise of the author that experienced and successful music performance educators have developed skills in determining what is important in a composition and that they too, pick and choose methods that fit the needs of their students. Successful music instructors share characteristics with the instructional designers as studied by York & Ertmer (2009, 2016).

Can these principles that instructional designers use in the design and development of their courses be applied to music performance education? Garofalo (1983), Miles & Blcher (2009) established some possible models for designing instruction for performance ensembles. Heretofore, it has been assumed that principles of design are incorporated into the preparation and the execution of music performance concepts of experienced music educators, however, the question may also be asked if any formal design or lesson planning is done at all beyond rehearsals for the next performance. It is easier to simply rehearse, but it is it worth the effort to plan and design for an all-encompassing curriculum and learning experiences for students?

**Purpose**

The purpose of this study is to identify underlying principles used by experienced music performance educators that inexperienced music educators do not. What are these principles? What guides the curriculum and lesson plan development of successful music teachers.

**Audience**

As this research seeks to identify principles of design that are used by music performance educators the target readership will be music educators across the country. Performance educators, in other artistic disciplines should be able to identify the principles of design that work for music educators and apply them to the other arts. In addition, educators of all subjects from STEM to career and technical education to the humanities will be able to identify the underlying principles and apply them to their practice.

The stakeholders will be teachers and instructors as outlined above, but also educational administrators. Administrators and school boards will be able to see principles of design that are guiding music educators in the development of their lesson plans and transfer the underlying principles to other fields of inquiry and instruction.

**The Question or Hypothesis**

The question of this current study is to identify underlying “design” principles used by effective college music instructors, high school music instructors, and junior high school (middle school) music instructors in their practice as music educators in music. The research will review the strategies of design employed by music teachers in performance ensemble settings.

**Methods for Gathering Data**

Data will be gathered through three rounds of surveys submitted to 5 experienced college music performance directors, 5 experienced high school performance ensemble directors and 5 experienced junior high/middle school level instructors. The same data will also be collected from 5 inexperienced (less than 3 years’ experience) high school directors and 5 inexperienced junior high directors. 5 inexperienced college directors will not be surveyed as college performance ensemble directors are required to have several years of experience and all college level directors are considered experienced. The pool of experienced directors will be from schools who have consistently received superior ratings at their regional music festivals over the last three years. The study is to discover what experienced and successful directors do for instructional design not necessarily on the level of the group or ensemble.

As the purpose of the study is to examine principles of design that are used by music performance directors (teachers) in the development of curriculum, a process similar to the Delphi process as outlined by Ertmer & York, et al., (2009) but adapted for music educators that are designing curriculum rather than instructional designers. The steps outlined in the Delphi Process are:

1. Selection of the participants as outlined above.
2. Creation and review of the first survey adapting the Delphi principles for music. The survey will include free response questions regarding score analysis and lesson plan development.
3. Execution of the first survey with the selected participants.
4. Data analysis of this first survey.
5. Creation of the second survey adapting the Delphi principles for music and expanding concepts as learned from the first survey. The survey will include free response questions regarding score analysis and lesson plan development.
6. Execution of the second survey.
7. Data analysis of the second survey.
8. Creation of the third survey seeking for further clarification on what was discovered in the first two surveys using the same techniques.
9. Execution of the third survey. This survey will also help determine the stability or consensus of the design principles exhibited in the survey.
10. Final analysis and dissemination of the results to participants with information written up and prepared for publication.

**How will data be analyzed?**

The results of the first survey will be analyzed looking for similarities and differences between each response. The purpose of the first survey is to discover principles that will guide the creation of the second and third surveys. The second and third surveys will be developed seeking clarification for items found in previous questions. As designers of curriculum, what are experience teachers doing that consistently renders superior results that inexperience teachers are not doing. The first survey is more descriptive of what is done and the results will be more qualitative than quantitative. The subsequent surveys will be designed to move the findings toward more quantitative analysis. The scope of the study is not to identify and codify precise practices that can be almost considered algorithms, but to discover trends, best practices and rules of thumb that will guide teachers and directors in the rehearsal of their ensembles.

**Limitations of the Research**

The findings will provide potential guidelines and rules of thumb for the designing of instruction in a music setting and will test how design thinking is used by experienced teachers and not used by novice teachers. While the scope is directly about music education, the principles of design thinking outlined will provide guidelines and principles for other subjects. Ertman and York (2016) showed that underlying principles in design are universal while practices are developed to fit specific subjects and methodologies. This research is being conducted to discover underlying principles of design in music performance curriculum development.

**Summary Statement and Conclusion**

Tim Brown (2008) and Roger Martin (2009) outlined the fundamental principles of design thinking as the process of moving knowledge, projects and products from mysteries, or only dreams, to heuristics (rules-of-thumb), to algorithms (replicability and reliability). In music education, Garofalo (1983) and Larry Blocher and Richard Miles (2009) outlined a process for designing instruction in performing ensembles.

It is believed by the author that experienced and successful music performance teachers design instruction for their ensembles differently than less successful and experienced teachers do. Through experience they have developed tools and methods that they can use consistently relative to the needs of the composition and the ensemble. The purpose of this study is to discover underlying design principles that experienced teachers use to develop their ensembles.

The Delphi process as outlined by Ertmer & York (2009) will be used as a model for research. A series of three surveys will be developed successively with each survey building upon the principles identified in the previous surveys. Not only will fundamental design principles be identified within the constructs of music education, it is the hope of the authors to show that design principles can be used universally from subject to subject.

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