

The Delphi Method for Program Enrichment: A Variation on the Theme

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ABSTRACT The aim of this paper is to illustrate how principles of the Delphi Method were used informally to evaluate and enrich a continuous professional learning (CPL) program. The program was developed to train classroom teachers to use music as support for diverse learners in an inclusive classroom. This paper explains the difference between the 'classical' Delphi method and the applied variant, and describes the method of the variant. As there is no known similar program, the first draft of the program was written by the researcher after a literature study. Experts were selected from different appropriate fields such as music education, inclusive education, creativity and materials development. An open-ended questionnaire was developed and e-mailed to experts, together with the first draft of the program. Responses were analyzed, categorized and incorporated into the program. Only one round was necessary. It can be concluded that this variant of the Delphi method was effective in ensuring that an innovative idea could be turned into a program and made available in a relatively short time to teachers in an enriched, practical format of good quality.

INTRODUCTION

Education specialists often develop programs to address existing problems in society, or difficulties that students experience. Unfortunately it is often difficult to evaluate and determine the practical effect of those programs on the students before implementation.

In a recently developed program the researcher used music in a creative way to empower class teachers to cope in inclusive classrooms. The aim of the program was to support elementary school class teachers to use music and elements of music (rhythm, melody, movement) to stabilize learners emotionally and to facilitate learning in an interdisciplinary way. Because of the multidisciplinary nature of the program, the researcher decided to use the Delphi method for the purpose of evaluation and quality assurance.

The Delphi method is a way of polling the opinions of a panel of experts on a specific issue (Okoli and Pawlowski 2004). Traditionally it is used to forecast events such as for military purposes, or to identify trends such as economic forecasts in the process of planning (Woudenberg 1991). However, it can also be used in education for a variety of purposes such as the development of curricula and learning experiences to prepare students for future careers (Green

2014:2), as well as for the evaluation of specific aspects of a program. The program that needed evaluation is multidisciplinary and needed experts from different fields to evaluate and make suggestions on the issues of content and style to enhance its practical value. While the experts were from disciplines such as inclusive education, music education, creative learning, professional learning, Open and Distance Learning (ODL) and materials development in ODL, they did not speak the same 'language' owing to their different disciplines. I, as the researcher, had to draw meaning from their opinions and integrate it into a logical whole.

This paper describes the process of evaluation with the Delphi method, the more traditional way in which the Delphi method can be used, how it compares to the 'variation on the theme' and the way in which the variant contributed to the evaluation and quality assurance of the program.

Background of the Study

The aim of the study was to provide a ready-to-use program without having to go through the process of testing, revising and re-testing the program, which would be time consuming. Choosing experts to address the wide range of issues related to this specific program was the determining step in the process of evaluating

the program, because the panelists' knowledge of the different aspects contained in the program is the most significant assurance of a high-quality outcome for my program (Stone et al. 2005). Generally Delphi panelists are chosen for their expertise rather than through a random process (Sprenkle and Moon 1996).

The experts from the different fields in this case were asked to evaluate the program by means of a review instrument provided to them. They received a cover letter, an open-ended questionnaire (review instrument), and the first draft of the program. The review instrument was adapted by the researcher from a similar instrument used with good results at The University of South Africa (Unisa). The questionnaire included category headings to stimulate and guide the experts' thinking. It also included open-ended questions which could be answered by participants whose participation was not hampered by time constraints. The major headings are the following: learning design, linguistic design (dialogue), instructional devices, visual design and assessment design. The review instrument also contributed to the reliability of the study as it provided category headings by which the responses were analyzed.

Theoretical Background

The study was conducted in the qualitative paradigm where the focus was on the interpretation of the experts' opinions of how the quality and practical application of the program could be enhanced. Open-ended questionnaires were used, as well as the option of rather submitting a two-page summary of suggestions.

A constructivist approach was followed. Constructivists assert that learners construct their own knowledge and understanding, based on their own perception and personal interpretation (Wink and Putney 2002). This may be especially true in the case of teachers, for which the program was intended, with their wealth of experience brought to the learning environment. The instructional events of this program were woven around the school, since constructivist learning occurs most easily, especially in a distance education environment (Holmberg 1997), when it is applied and woven around authentic problems. Each module started with a scenario of a problematic situation in an inclusive classroom, which challenged the teachers to solve the problem with their existing knowledge. These authentic contexts offer ample opportunities for

social interaction and collaboration (Calvert 2005) which is how initial learning takes place, according to the social constructivists such as Vygotsky (Freeman 2005).

The content of the program to train teachers to use support techniques based on musical activities, is also embedded in the constructivist idea of semiotic mediation, where tools and signs (such as language and music) are used as media to perform activities (such as teaching) with specific objectives (such as creating powerful learning environments) towards specific outcomes (the development of all pupils, including learning disabled pupils) in specific socio-cultural settings (schools). The 'rehabilitation' of 'handicapped' learners was an area of the activities of Vygotsky for which such a mediatory tool as music could be used (Kozulen 1990).

Where the Delphi method is normally geared towards the crystallizing of (a) question(s) into (a) single answer(s), the way in which the principles of the Delphi method were used in this paper, stimulated a polyphonic dialogue (Bakhtin 1990) to give colorful, creative outcomes, each suggestion from a different background. The researcher was able to choose from a variety of initiatives those which she thought best fitted her aim. The assortment of ideas included creative plans regarding content, technical aspects and the idea that the program should be part of a package that also contained audio-visual material.

METHODOLOGY

The Delphi Method

The Delphi method is an idea generative, explorative method of generating qualitative and quantitative data (Green 2014). In the 1950s and 1960s, mainly quantitative data were generated with the forecasting of dates and estimating unknown parameters (Woudenberg 1991). From 1970 onwards the educational and communicational possibilities were more frequently stressed (Green 2014; Woudenberg 1991). The Delphi method can also be a hybrid of the two convergent methodologies (Franklin and Hart 2007).

The three types of Delphi research methods discussed in literature are the classical, decision making and policy Delphi methods (Linstone and Turoff 1975; Franklin and Hart 2007). The intent of the study becomes the determining factor for the types of Delphi methods to be used. The

purpose of a classical Delphi technique is to establish facts, or to estimate unknown parameters. This Delphi method has an objectivistic nature, as the statements from the experts are considered as facts and objective truths (Stewart 2001). A 'decision-making' Delphi could be used to encourage collaborative decision-making developed from an interactive process. The policy Delphi, being a forum for generating ideas with little historical context (Franklin and Hart 2007: 237), fits well into a constructivist paradigm (Stewart 2001: 923). See theoretical background.

Overarching the three types of Delphi methods, certain general principles can be identified which can be described as the basic principles of the Delphi method. Variations on the Delphi 'theme' may involve variations of the different aspects of what can be seen as those Delphi principles. One such general principal characteristic of the Delphi method is that the experts taking part function in an anonymous way, thus limiting the negative psychological forces of

group interaction (Hogard 2007: 309). However, variations occur where Delphi research has been conducted with partial anonymity of the experts, or where Delphi research without a first inventory round is used to save time. The inventory round can then be replaced by interviewing key persons (Woudenberg 1991: 133). The policy Delphi method can be seen as a deviation from the principle of 'reducing/crystallizing' the opinions of experts in different rounds to the point of consensus (Franklin and Hart 2007: 238). In the research that the researcher conducted, the use of one round only was a further deviation from the so-called general principles of the different variations of the Delphi. The research executed by the researcher, needed only one round to gather a variety of opinions from the experts, which was considered sufficient for the purpose of my study.

Table 1 is an illustration of the differences between the original (classical) Delphi method and the one used by the researcher for this study.

Table 1: Differences between the original Delphi method and the variant used

<i>Original Delphi</i>	<i>Variant used in this study</i>
<i>Purpose</i> Used for forecasting in science projects, such as the probabilities of the prevention of war, air pollution, aerospace, technology, etc. It is used as an exploratory instrument (to find out what is probable).	Used in education for evaluating an educational program
<i>Number of Rounds</i> This is a repeated process of many rounds, which continues until the need for information is saturated. Responses are summarized and returned to participants for comment.	One round was conducted, as the information gathered in the first round proved to be sufficient for the necessary adaptations to the program. No further comments were needed after the first round.
<i>Panel of Experts</i> Experts are mainly from one discipline.	The experts are part of a multi-disciplinary team.
<i>Review Instrument</i> Questionnaires and open-ended questions are used for responses (Sprenkle and Moon: 1996: 16). The expert opinions represent the 'guide' from which further opinions are gathered, until the point of consensus is reached.	The developed program was provided as a stimulus. A questionnaire with open-ended questions served as a measuring instrument. Two-page summaries of comments and interviews were provided for detailed responses.
<i>Data Processing and Utilization</i> Experts give judgments and do guesswork. Consensus is then shaped through feedback.	Rational and subjective judgments are given by experts. Their suggestions are then incorporated into the program according to the opinion of the researcher.
<i>Advantages</i> Forecasting can be done in a more reliable way by using the shared opinion of a group of experts, yet ensuring that no person's opinion is spoiled by social interaction.	The program is infused with expert knowledge and insight from different disciplines. Recent research is made available to teachers in a practical manner in a ready-to-use format. Experts may have more recent knowledge than that available in literature. Testing of probabilities is possible. The experts are not anonymous; the researcher can easily clarify meaning. The size of the panel can be relatively small (time- and cost-effective).

A discussion of the aspects indicated in the table as deviations from the traditional Delphi method will follow.

OBSERVATIONS AND DISCUSSION

Selective Program Evaluation

The first draft of the program that the researcher developed is aimed at continuous professional learning as an empowerment for teachers within the inclusive paradigm. The aim of the program is to coach class teachers with no formal music training to use music in a creative way to deal with emotional and academic problems, and it is meant ultimately to help turn the tide towards fully functioning schools in South Africa. The researcher needed the content and technical aspects of the program to be evaluated, and for the quality assurance to be conducted by experts in different disciplines.

Content of the Program

The researcher needed input from music teachers who had knowledge and experience in class music to evaluate her ideas of exercises which can be used in an elementary classroom to develop a variety of developmental and academic skills. The exercises were planned to be interesting and sufficient fun so that the entire class (learners with and without barriers to learning) would enjoy the activities. The experts that the researcher chose also had to have a background of adult learning to help me to present the exercises in a format which teachers without specialist knowledge in music would be motivated to test in the classroom situation.

The difficult part was to write the program in an inviting manner so that teachers, who have already been overwhelmed by the political and educational changes in our country since 1994 and the resulting volume of paperwork, would be motivated to attempt another new program. One of the chosen experts suggested that, as part of the motivation strategy, the teachers' attention should immediately be drawn about what they can do. She recommended that the following questions could, for instance, be asked at the start to motivate the teachers and convince them that they have the basic skills needed to learn to use music in the classroom:

- ♦ *Can you keep a tune? And dance?*
- ♦ *Can you do rhythmic clapping?*
- ♦ *Do you know approximately 10 nursery songs and can you teach them to learners?*
- ♦ *Can you play a CD in your class? Which specific CD would you like to use and why?*
- ♦ *What do you understand by creativity?*

The length of the program posed a problem for most of the experts, because of all the information it contained. The general consensus was that a study package should be developed, consisting of a reference source, a study guide, a DVD containing demonstrations of how music could be used creatively in different contexts, and a CD with music suitable for use in the classroom.

Technical Aspects

After studying the work of Duffy and Forgan (2005: 112-113), Gordon (2004: 35) and Kelchtermans (2004: 231) the researcher was relatively confident that she would be able to apply the principles of adult learning in this continuous learning program. Her greatest need in this project, however, was to have support with the development of the program. The researcher included three persons on her list of material developers from the Institute for Curriculum and Learning Development, Unisa (ICLD). One of the material developers could not take part, but the researcher was left with two knowledgeable, creative persons whose suggestions were crucial to the success of the program.

For example, one of the significant principles of Open and Distance Learning may be the '*just enough, just in time*' principle. One of the experts suggested that the material be arranged in the following way:

Each unit should start with an authentic problematic classroom scenario where the teacher is confronted with specific, but different problems. Teachers should be asked to solve the problems of the imaginary teacher by using their own experience. Only thereafter could musical examples be provided as an alternative means by which the problem could also be solved. The theory was to be presented last.

Number of Rounds

With the evaluation of this program, the main deviation from the classic Delphi method fol-

lowed after the first collection of the suggestions from the experts. The researcher realized that she had data rich enough for the purpose of evaluation and quality control after the first round, while the classic Delphi method and the variations usually need two to three rounds before saturation of information occurs or consensus of opinions can be reached. Here consensus was not needed and there were no conflicting opinions, probably because of the wide variety of expertise.

Panel of Experts

The quality of the outcomes when the Delphi method is used is dependent on the knowledge of the experts selected (Stone et al. 2005: 242). Therefore Delphi panelists are chosen in a subjective way for their expertise rather than through a random process (Sprenkle and Moon 1996: 16). The researcher chose experts from different areas of specialization, not necessarily from different geographical areas as normally happens in a Delphi. The criteria for the selection of experts were knowledge, experience of and involvement with creativity development, school music, professional learning and the design of study material for distance education. The researcher did not realize at that stage that interest in the topic should be one of the top priorities. The brainstorming aspect (which leads to possible consensus) was not important in this case, because each panelist performed an independent assessment of the program according to his or her specific field of expertise. Although all the experts lived/worked in relatively close proximity to each other, each individual's initial assessment was conducted independently and was not influenced by that of other panelists.

Literature offers different views on the optimal size of a Delphi panel. It is important though that a representative panel be selected (Bezuidenhout et al. 2004: 222). Ten panelists were chosen to take part in this study (Table 2). They were contacted, the research was explained to them and they agreed to take part in the project.

In retrospect, the researcher realize that she actually needed at least two teachers who were at that stage teaching inclusive, multi-cultural classes. It would also have been valuable to consult at least one knowledgeable black teacher, for example, to gain easy folksongs in the black culture to include in the repertoire before designing the program. The researcher did not do pre-consultations, or ask teachers to do some pre-testing, which would probably have added value to the program.

Gender was not considered, as the researcher did not think that it would play a role. Age was considered in an indirect way, because of the premium that was put on expertise. However, probably the youngest participant expressed comments in the strongest way and also contributed valuable ideas on how to put the principles from the literature study into practice. The oldest expert, who is already retired, provided extensive feedback and was also available for two interviews, one to make sure she understood what the researcher wanted and the other to explain her notes and to give additional general hints related to various aspects of the program.

Three of the group of seven experts were English-speaking and four were Afrikaans-speaking. They were included to test the relevance of the material for different language groups.

Within one month seven participants had returned the questionnaires. The three experts who did not complete the evaluation offered

Table 2: List of experts

Expert A	Retired Professor of Music from a neighboring university. Extensive experience in school music
Expert B	Professor of Music from a neighboring university. Extensive experience in school music
Expert C	Expert in materials development, who had been seconded in an advisory capacity to the Management of the Institute for Curriculum and Learning Development, ICLD, Unisa
Expert D	Holds a doctorate in Education, Professor in Materials Development, ICLD, Unisa
Expert E	Professor of Education, experienced in materials development for short courses
Expert F	Expert, and author of publications on creativity
Expert G	Practicing music teacher in Inclusive Education
Expert H	Former Professor of Education, Unisa, currently running a private school specializing in teaching for creativity
Expert I	Senior educationist, experienced in subject management
Expert J	Professor in Materials Development, ICLD, Unisa

various reasons for their failure to do so, such as time constraints and the size of the program. Data could therefore be obtained from seven out of 10 of the participants. Two of those seven completed the questionnaire, four summarized their comments and four supplemented their contributions with oral recommendations.

Review Instrument

Although many instruments for program evaluation are available (McMillan and Schumacher 2006: 133), specific measures had to be used for the evaluation of this program; therefore the researcher had to adapt a similar instrument for program evaluation to enable the gathering of relevant data for this program. This instrument, developed by M Roman (2002) from the (then) Institute for Curriculum and Learning Development (ICLD) at the University of South Africa as a generic evaluation instrument, was adapted for different colleges and has been used with satisfactory results since 2002.

The experts were asked to evaluate the program by means of the review instrument provided to them. They received a covering letter, a questionnaire with open-ended questions (the review instrument) and the first draft of the program. The review instrument was adapted by the researcher from the generic evaluation instrument described above. The category headings of the review instrument were designed to stimulate and guide the experts' thinking, as well as to provide some structure to the analysis executed by the panel of experts and to enable the researcher to compare the feedback received from the panel members.

The major headings used in the review instrument were the following:

1. Learning design;
2. Linguistic design (dialogue);
3. Instructional devices;
4. Visual design;
5. Assessment design.

The review instrument contributed to the reliability of the study, as it provided guidelines which enabled replication of the evaluation process in similar circumstances.

The main comment of the experts was that music and creativity were not mentioned frequently enough in the review instrument (see headings of the review instrument); it should have taken center stage. One participant com-

mented that the measuring instrument has value, standing on its own, but that she missed the logical connection with the purpose and theme of the study, namely creativity and music. The following came to the fore:

You should address the terms music and creativity in a much more dominant mode.

One expert suggested additional questions, including the following:

How can creative thinking and actions be learnt?

How do I utilize music?

How do I know that the negative situation in the classroom is 'counteracted' by the course?

Will the program enable the student to teach creatively?

How can skills and the attitudes be changed in a distance situation?

How can I be sure that the teachers will indeed apply this in their daily teaching?

The experts gave more information than the researcher asked for during the interviews by their extensive replies to the semi-structured questions and the two-page summaries which some of them preferred to make.

Data Processing and Utilization

Data processing is the complete process of the collection and manipulation of gathered information to produce meaningful data. The panelists were afforded the opportunity to express their opinions by means of a review instrument, compiled as an open-ended questionnaire, and/or by means of a two-page summary of their recommendations. In four cases, the collection of the material was followed by conversations with the experts, which added to the richness of the suggestions.

In the survey the experts were requested to accept or reject the information included in the study material (content). This information included the themes as presented in the six units in the first draft of the program, as well as the presentation of the program. Panel members were asked to insert any additional suggestions. After the completion of Round 1, the data gathered from the questionnaire was read and categorized by hand. Further clarification was sought from two experts. The categories developed from the open-ended questions and the pre-determined categories in the questionnaire were combined, contextually

analyzed and the suggestions were evaluated for incorporation into the revised program.

Advantages of the Delphi Method for Program Evaluation

Because this introduction to the use of musical activities in inclusive classrooms is new in South Africa, there was no other program against which to benchmark this program. Using this variation of the Delphi method of generating data to enrich the content and technical aspects of the program enabled the researcher to enhance the quality of the program before implementation. It is possible through the use of the Delphi method to incorporate the experience and knowledge of specialists in different fields to refine the program.

There is often a gap between research and practice; this may be because teachers are not necessarily aware of research being done to alleviate their burden, or they may not be able to implement the research. This program may be an example of research made immediately available to teachers in the classroom situation. The value of the suggestions provided by the experts was significant in the sense that they added a dimension of practical knowledge of what could work in the classroom and in distance education, which had not been provided by the literature study alone; for example the principle of providing 'just enough (information), just in time' principle (see *Content of the Program: technical aspects*). Another application of the Delphi method could for instance be that policy and/or curriculum adaptations could be given to teachers in a program format which had gone through the 'digestive' process by a panel of experts. It could help teachers to apply those immediately in the classroom situation.

An advantage of making use of practicing experts is that they may be at the forefront of developments in their fields. They may thus have knowledge and insight on hand which may not yet be available in literature. The experts that the researcher used have had daily experience of program development in the specific situation for the students for whom the program was mainly written.

An important aspect for me was that the experts confirmed the notion that class teachers could indeed use music much more freely in the classroom for emotional and academic objectives.

None of the experts in music who studied the program doubted that it was possible to train class teachers to support learners in that way. South Africans in general are colorful, spontaneous people. In black cultures specifically, music is not alien to their daily activities. They can also spontaneously join in singing and music making in most circumstances. The characteristics of teachers who would successfully engage in such a practice, as well as the types of music to be used, were not discussed in this paper, because of the problem of insufficient space.

The members of the panel are unknown to each other, but not to the researcher. The advantage is therefore that the researcher can easily get explanations, or richer data, if required. After the evaluation all the experts were approachable and willing to grant informal interviews.

The size of a Delphi panel can be relatively small, depending on the program to be evaluated, which can be time- and cost-effective.

CONCLUSION

Exploring the possibility of a radical change in teacher learning in a specific community, and to make the program immediately available, was made possible through the involvement of a panel of experts via the Delphi method. The world famous Oracle of Delphi played an influential role in ancient history. For fourteen centuries the Oracle helped determine the course of empires. By using this variant of the Delphi method, the experts consulted also played a determining role in the quality of this program. This variant of the Delphi method was effective in ensuring that an innovative idea could be turned into good practice and be made available to teachers in a practical format to support them and lighten their burden. The researcher found that the Delphi method can be an adaptive tool for evaluation and quality assurance purposes.

RECOMMENDATIONS

- ♦ The basis of the validity of many Delphi methods is the quality of the experts. Their contributions determine the quality of the program.
- ♦ A sound literature study to develop a valid first round of questions is required. It is suggested that researchers spend sufficient time on the development of the first round of

questions. This can largely determine the quality of the research. They would not want to waste the time of experts on adaptations at a later stage.

- ♦ It is imperative for the richness of the suggestions that the experts are really interested in the topic. Those who needed to be convinced eventually withdrew, mainly because of time constraints. The person who was prepared to spend more time than usual on this project was a recently retired professor who still enjoyed the involvement in academic activity. Perhaps retired academics are a good source of panels of this nature.
- ♦ It is recommended that the experts consulted are from the same institution where the program will be presented. In the case of this research, which was done in Open and Distance Learning, all the experts in materials development were from the same institution. They were therefore acquainted with the circumstances and the type of students for which the program was written. This had implications for the authenticity of their contributions.
- ♦ It would, however also add value to the research to invite international experts who are geographically dispersed to serve on the panel; with the technology available to everyone, sending the necessary material, such as a programs and questionnaires by e-mail is both cost-effective and fast. The heterogeneity of a panel adds to the richness of suggestions.
- ♦ Practical guidance from professional material developers is necessary for the development of good material, especially in distance education. The rearranging of technical matters contributed towards motivating the teachers to reflect on and be involved in the program.
- The disadvantage in this study, and probably also in other cases where the Delphi method will be used for program evaluation, was the volume of the program (201 pages) that was used to elicit responses from the experts who often are still involved in demanding professions. Knowing that the evaluation of all the material involved would be very time-consuming, it was no easy task to approach the respondents to request their participation. It is advisable to have a budget from which the experts can be paid a gratuity for their valuable assistance.

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