An exploratory study investigating the impact of a differentiate framework of instruction on generalist teachers perceived confidence to teach visual arts

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Abstract

This article reports on an exploratory study that addressed the low confidence levels of 80 generalist primary student teachers enrolled in a mandatory visual arts course. Previous studies in this area have found that a cycle of neglect exists in Australia, as a result of educators' lack of confidence in their ability to teach visual arts. This is believed to create a knock on effect whereby generalist primary student teachers enter mandatory tertiary visual arts units with little belief in their own art ability. This exploratory study centred on proactively applying the Tomlinson Model of differentiation in an effort to raise student confidence levels. By providing students with multiple avenues to access essential course understandings, students' perceptions to teach visual arts changed significantly by course completion. This research has significance as there is a paucity of research re the implications of implementing a differentiated model of instruction at the tertiary level

Introduction

The benefits of teaching visual art are well known and have been generally accepted for several years in the education community (Laird 2012). Knowledge of the visual art has been found to encourage the understanding of other cultural groups, and foster affective development and divergent-thinking skills (Ewing 2010). It has also been linked to increased mathematics and language proficiency (Vaughan, Harris & Caldwell 2011). The development of many 21st-century skills such as creativity, higher-order thinking, collaboration, visual literacy and problem-solving have also been linked to schools with art-rich programs (MCEECDYA 2007). Government and industry have recognised that the workplace is changing dramatically, and have recently begun to champion art education in an effort to ensure that these types of skills are developed in schools (Oakley 2007). Nevertheless, despite these positive outcomes, research has demonstrated that visual art is still rarely taught in Australian primary schools (Department of Education, Employment and Workplace Relations [DEEWR], 2008). Low levels of confidence in teaching art have been highlighted in the research as one of the main reasons art is not taught at the primary-school level (Lemon & Garvis 2013; Ewing 2010).

Literature review

Why has art education been neglected when its benefits are so well known? First, while there is a large body of research that clearly demonstrates the cognitive and affective benefits of art education, it is still generally perceived as a superfluous subject. This means that it is often sidelined to make time for subjects that have traditionally been seen to hold more value, such as science, mathematics and literacy (Ewing 2010; Rabkin & Hedberg 2011). The current emphasis on high-stakes testing in Australian schools has compounded this problem, with additional time now needed to prepare students for national standardised tests (Russell-Bowie 2012). This leads in turn to large cohorts of generalist primary-education students entering visual-art subjects with poor art skills and low confidence in their ability to teach visual art, due to their own limited art experiences (Garvis & Pendergast 2010). Despite this fact being well established, art-education subjects at the tertiary level have been seen to decrease rather than increase in length (Ewing 2010; Russell-Bowie 2012). Current research suggests that many student teachers perceive that they do not gain the necessary skills and knowledge in their tertiary subjects to teach art in primary schools, thus perpetuating the cycle of anxiety and neglect in art education (DEEWR 2008).

Results from studies addressing the implementation of the differentiated-instruction approach have found that it can improve students' perceived confidence levels by providing different avenues to support learning (Flaherty & Hackler 2010; Tulbure 2011; Pham 2012). Most of the research in this area has been at the primary and high-school levels (Dosh & Zidon 2014; Santangelo & Tomlinson 2012); a review of the literature found that the differentiated framework of instruction has rarely been applied at the tertiary level (Tulbure 2011; Santangelo & Tomlinson 2012).

The purpose of this study was to gain a preliminary understanding of whether the application of a differentiated model of instruction could have a positive impact on generalist teachers' perceived confidence levels to teach visual art. The research question that served to focus this study was: How does using a differentiated framework of instruction affect generalist student teachers' perceived confidence levels in the teaching of visual art at the primary-school level?

This study has significance, as current research indicates that both primary-school educators and generalist pre-service teachers continue to demonstrate low levels of confidence to teach visual art

(Russell-Bowie 2012). This research seeks to address this problem at the tertiary level by determining whether an alternate pedagogy, such as Tomlinson`s model of differentiated instruction, could increase students' confidence by offering them multiple pathways to access content and increase skill level.

Theoretical framework

Tomlinson's model of differentiated instruction (2014) formed the theoretical basis for this research. This model of instruction is firmly grounded in educational theory. It draws on Vygotsky`s (1978) sociocultural theory, Sternberg's Triarchic Theory of Human Intelligence and Csikszentmihayli`s theory of flow. The Zone of Proximal Development (ZPD), which is central to Vygotsky`s sociocultural theory, addresses student readiness levels, as well as their potential level of development. Parallels can be drawn between Vygotsky's ZPD and Csikszentmihayli`s theory of flow, with both theories recognising that unless students' readiness levels are taken into account, optimal learning is unlikely. For example, to achieve a state of *flow,* whereby a student is intrinsically motivated to learn, educators needs to set challenges that match students' readiness and skill level (Csikszentmihalyi 2000). In his theory of flow, Czikszentmihaly links interest and motivation, perceiving that a student is unlikely to be motivated to learn a topic unless their interests have been addressed (Csikszentmihalyi 2000).

The importance of recognising a student's learning profile has been supported in the research literature by theorists such as Sternberg and Gardner. Sternberg (1997), in his Triarchic Theory of Human Intelligence, recognises that each student has a preferred way of thinking, such as analytical, creative or practical. A person who favours analytical thinking has the capacity to think abstractly and analyse information. This type of person usually excels in mathematical and verbal skills. One who prefers using creative thinking has the ability to think divergently and discover new ways of doing things. Lastly, a person who prefers to think in a practical manner is one who can easily take the knowledge they have learnt and apply it to everyday situations in the real world. Gardner, in his Theory of Multiple Intelligences, has, like Sternberg, also recognised that each student has a preferred way of learning related to their unique set of intelligences.

The Tomlinson Model has been built on these leading educational theories, and describes differentiated instruction as consisting of three significant curricular areas (Tomlinson 2014): content – what the instructor plans to teach and wants students to learn; process – how students are intended to make sense of this information; and product – how students show what they have learnt (Sousa & Tomlinson 2010). According to Tomlinson (2014), educators can use teaching strategies to alter content, process and product based on students' readiness levels, learning profiles and interests. "Readiness" in this model is not tantamount to academic ability, but instead comprises prior learning, skills and understanding related to the content being introduced. "Student interest" refers to topics and procedures that foster student motivation and curiosity. "Learning profile" refers to the way the student learns best, and includes learning style, preferred group makeup (such as individual, pair or small or large group) and environmental considerations. The learning environment plays a key role in the Tomlinson Model, and can be differentiated to accommodate diverse learning through the physical arrangement of the room (such as the use of space and the arrangement of furniture). It also includes the social and emotional aspects of the learning environment that support student learning.

Method

This exploratory study followed a mixed-methods approach. Quantitative and qualitative data was obtained through the use of pre- and post-subject surveys that were specifically designed for this exploratory investigation (Appendix A). A five-point Likert scale was used in both surveys to measure perceived confidence levels. Qualitative data was collected through the use of open-ended questions that required the generalist pre-service teachers to reflect on their perceived confidence level for teaching art before and after the subject.

Participants

The study was conducted at a small urban university in New South Wales, Australia. Participants for this study comprised 80 generalist birth-to-12 and primary pre-service generalist teachers enrolled in their second year of a bachelor of education teaching degree. Participation in this study was purely voluntary and participants could freely withdraw at any stage. The participants were all enrolled in a six-week visual-art subject specifically designed to prepare non-specialist pre-service teachers to teach visual art at the primary-school level. This participant sample was selected as all the participants would be expected to teach art in Australian primary schools. Ethics approval was obtained from the university's HREC for this study and guidelines were strictly adhered to.

Instrumentation

The success of the intervention program in this exploratory study was measured by anonymous pre- and post-subject self-completion surveys. The initial survey was made up of questions that were specifically designed to reflect Tomlinson`s model of differentiation. Data was collected to attain information on students' visual-art readiness, interests and learning profiles. For example, students were asked about prior visual-art knowledge and specific art interests, as well as how they learnt best. This information was then used to differentiate the subject content, delivery, product and learning environment for the cohort in this study. These differentiations of are key features of Tomlinson's model of differentiated instruction, which is an integral part of the theoretical framework of this paper.

Procedure

Both pre- and post-subject pilot surveys were completed during regular class time and were not matched for individuals, as their sole aim was to ascertain participants' confidence and perceptions about teaching visual art before and after training. The initial survey was carried out at the first seminar of the subject, and the second was carried out at the last seminar. Participation was anonymous and voluntary, with the process of handing out and receiving the surveys being administered by a staff member not associated with the subject in any way.

Data analysis

The initial step in data analysis was to read through the surveys and record the readiness levels (confident, moderately confident and not confident) within the cohort. Data was then summarised into nominal scales by degree of confidence. Data regarding the students' learning profiles was also recorded as auditory, visual, kinaesthetic or a combination. The same was done for the other aspects of each student's recorded learning profile. These results were then organised from most to least frequent so that accommodations could be made in subject content and setting. Specific artists about whom the students were interested in learning were also noted, as well as favoured

artistic mediums. Tabulated data was then used to modify the content and delivery of the subject.

Differentiating content

"Content" refers to the essential knowledge, skills and understanding achieved by students at the completion of the subject. Specific strategies for differentiating content included curriculum compacting, concept-based teaching and the provision of varied texts and resources.

The initial survey and weekly pre-tests enabled subject content to be tiered by student readiness, interest and learning profile for the cohort. For example, the initial pre-test revealed that a large number of student teachers enrolled in the subject had given up visual arts as a subject soon after entering secondary schooling, while a minority had taken the subject in their final two years of secondary school. This offered useful information for differentiation of skill level. For example, it would have been inappropriate to ask generalist pre-service teachers with advanced brushwork skills to attend the basic-brushwork session or to address content that looked at the elements of art. Mini-workshops within the larger workshop allowed students at each readiness level to have their learning needs met while all students worked on the same concepts.

Curriculum compacting further supported diverse readiness levels, as student teachers with advanced readiness levels were able to test out of content that they already knew. This allowed these students to remain challenged, as they were able to access content at an extension level. Likewise, flexible grouping allowed for students to be grouped by readiness levels so that students with advanced knowledge could engage in extension tasks and those that needed more support could have their learning scaffolded.

Attention was also given to students' visual-art interests, which were incorporated into the subject as art walks, gallery visits and art-appreciation tasks. The provision of varied resources also allowed students to access content at their specific readiness levels, as well as follow specific visual-art interests. Content was also adapted by learning profile, as some students were likely to find the lecture format beneficial, whereas others preferred visual resources such as diagrams, or audio resources such as podcasts.

Differentiating process

"Differentiating by process" refers to what opportunities were provided for students to process the content or skills learnt. Multiple modes of content delivery, such as podcasts, graphs, blogs and text, were used to enable students to interact with the content. Diverse learning modes were further supported by the posting of a variety of resources on a learning-management system (Blackboard) that took into account the cohort's diverse interests, readiness levels and learning profiles.

Differentiating product

"Differentiating by product" relates to the options that were given to students to demonstrate their knowledge, understanding and skills they had gained as a result of participating in the subject. Assessment in a differentiated context is different from the norm in that assessment informs instruction and is therefore carried out even before the content is delivered, as well as during and after delivery. The assessment tasks were based on the standards that were addressed throughout

the subject. Students were offered multiple ways to demonstrate mastery at subject completion.

Assessment for visual art did not consist of a single summative task; rather, it was made up of several ongoing formative tasks that were used both for diagnostic and evaluative purposes. The first assessment was non-graded, and was carried out through the administration of the initial self-completion survey, which included short-answer responses, interest inventories and a learning-preference checklist. The results from the survey were used to refine and revise the planning of the weekly workshops and seminars. Diagnostic feedback was also obtained from weekly pre-assessments that demonstrated the students' understanding of the content, as well as any misunderstandings. These results were purely for diagnostic purposes and allowed the instructor to address student variance as well as their understanding of the content. Strategies to obtain this type of information ranged from exit cards and graphic organisers to simple indicators from the students (such as a thumbs up or down). Formative assessment tasks were also non-graded, but provided students with feedback so that they were able to gain a good understanding of how they were faring.

The summative tasks, while graded, were differentiated and offered a variety of open-ended assessment options within set criteria. The tasks were purposefully designed to allow students multiple avenues to demonstrate the knowledge they had gained in the subject. For instance, students could select a key concept, such as "pattern", as well as grade levels of their choice. They could also select the way they delivered their assessment task to the group, such as through a podcast, presentation or interactive activity. Variable time frames were also offered for one of the assessment tasks, as groups could select which week they preferred to present and explain the use of their art-education teaching resource to their peers.

Differentiating learning environment

Data obtained in the initial survey was also used to modify the affective and physical environment of the lecture hall and workshops. While individual learning needs were recognised, activities were also designed to promote community amongst the pre-service teachers through the use of a variety of differentiation strategies, such as jigsaw and flexible grouping. Flexible grouping encouraged students to work with different people based on common interests, learning profile and readiness levels. This meant that students met with peers with whom they might not previously have had much contact.

Learning preference was also differentiated through the provision of choice of learning environment, as the initial self-completion survey indicated that some individuals preferred to work in small, quiet spaces such as the study rooms at the library, whereas others preferred bright, large, active environments such as the lecture hall.

The physical arrangements of the workshops were flexible, with the furniture being organised in a variety of configurations; for example, for individual and group work. It was also organised for optimal learning depending on the task involved, such as a horseshoe for still life and stations for printing. The lecture hall was also turned into a weekly art gallery based on students' art interests as represented in the initial survey and weekly pre-tests.

Summary of findings

Initial self-completion survey

Findings for this exploratory study suggest that students can make significant gains in their confidence to teach visual art when provided with a differentiated framework of instruction. Data was collected from a pre- and post-subject survey. Weekly pre-tests were used to collect information on students' readiness levels and interests as new topics were introduced. Pre-assessment data-gathering techniques allowed the content, process and products to be modified to suit the cohorts' unique learning needs.

The first question on the initial question self-completion survey asked participants about their previous art experience, so that the subject could be differentiated to suit the various readiness levels in the cohort. Figure 1 shows that over half of the cohort had last taken visual-art education in year 8. Only 18% had undertaken visual art as a subject in their final years of secondary schooling, while the remaining students had taken it as a subject until year 10. These findings correlate with previous research that found that the majority of tertiary student teachers enrolled in the primary-education visual-art subject had little previous experience in visual-art education (Lemon & Garvis 2013).
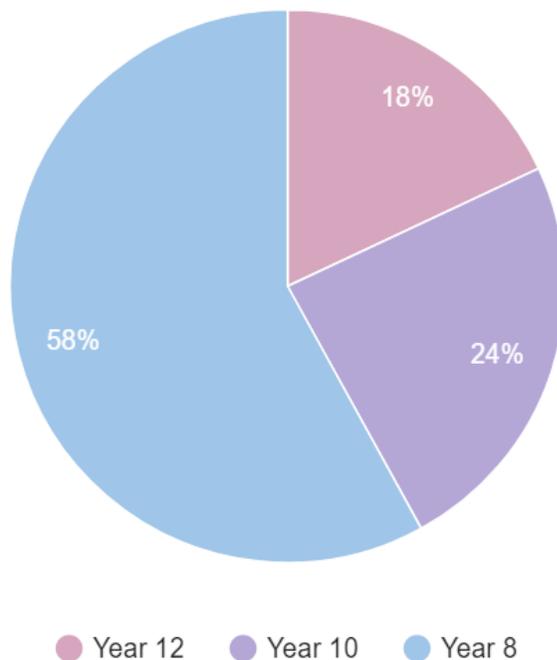

Figure 1.   Previous visual art education

The next question addressed how confident the participants felt about teaching visual art at the primary-school level and to explain why they felt that way. The majority of participants enrolled in the subject reported that their lack of previous art education affected their perceptions about their ability to teach visual art. One of the participants commented, "I feel inadequate for I have minimal to no content knowledge on various ideals, concepts and developments of art." Many said

that their lack of experience in art education was further compounded by the lack of opportunity to practice teaching visual art while on practicum, as other areas such as mathematics and English took priority: "I don't feel confident teaching visual arts, this is because I have not been exposed
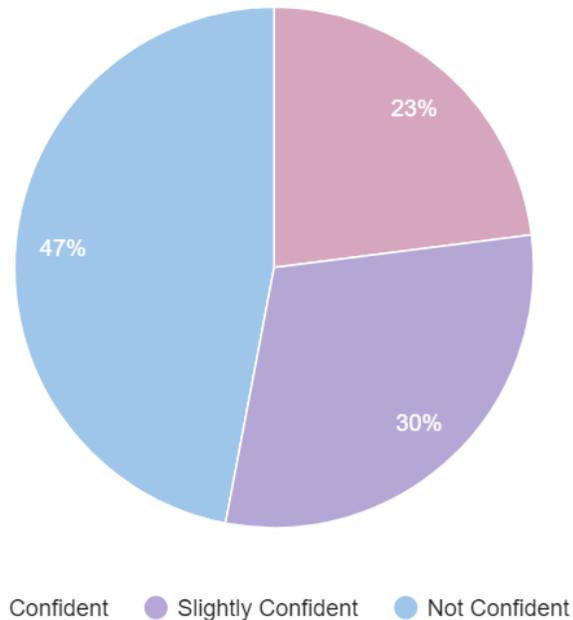
to it."

Figure 2. Students' perceived confidence pre-subject

Post-subject self-completion survey

At the end of the six-week visual art subject, participants were asked again about their perceived confidence in their ability to teach art at the primary-school level. The data from the post-subject survey indicates a significant increase in student confidence: from 23% to 76%. The results show, as illustrated in *Figure 3*, that none of 80 generalist teachers selected the not confident criterion on the post-subject survey. This change in perception was further supported by students' comments, such as:

"From the beginning of the [subject] until now I am feeling much more confident about teaching visual art, as I understand the foundations of art a lot clearer. The [subject] has really helped with differentiation, teaching concepts and models."
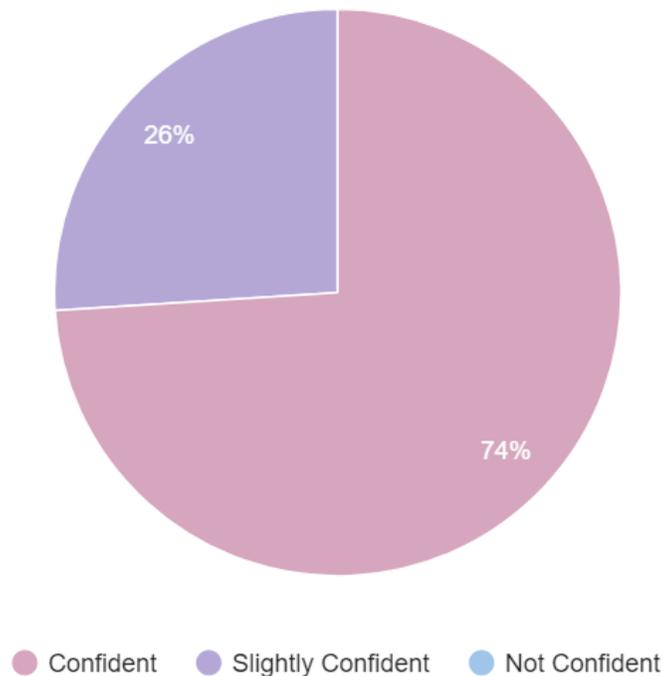
Confident   **Slightly Confident**   **Not Confident**

Figure 3. Students' perceived confidence post-subject

This exploratory study was designed to determine whether the application of a differentiated framework of instruction had an impact on pre-service teachers' perceived confidence levels to teach visual art at the primary-school level. The results from the pre- and post-subject surveys suggest that when presented with learning experiences that took into consideration diverse readiness levels, interests and learning profiles, students were better able to access the subject content. The growth in confidence levels may indicate that the application of a differentiated framework improved students' perceptions of their ability to teach visual art.

Conclusion and limitations

This exploratory study was carried out in response to the continuous cycle of neglect in the delivery of visual-art education at the primary-school level. Previous research has outlined how primary-school student teachers enter tertiary institutions with low confidence in their ability to teach visual art; this lack of confidence is then carried forward to their own primary classrooms (DEEWR 2008; Laird 2012; Lemon & Garvis 2013). If anything is to be done about this, the problem must be tackled at the tertiary level, where primary-school teachers receive their training in visual art. An alternate model of instruction, such as differentiated instruction, may allow students the opportunity to better access the subject content and consequently develop their visual-art skill level, as well as their knowledge. While differentiation of instruction has been successfully implemented at in primary and secondary schools, it has not been commonly applied at the tertiary level (Dosch & Zidon 2014). Indeed, current research indicates that tertiary educators generally deliver instruction through lectures using a teacher-centred, rather than student-centred, approach (Tulbure

2011; Santangelo & Tomlinson 2012). It was therefore difficult to find examples in the research to build upon when conducting this study. Subsequently, it is hoped that this study can act as a guide for educators wishing to apply a differentiated-instruction framework to their courses.

Applying a differentiated framework at the tertiary level is not without its difficulties. Problems were encountered in this study that may not exist outside the tertiary level. For example, tertiary-level instructors have large cohorts and don't usually see their students for more than a few hours a week. The roles other than teaching, such as researching and consulting, add to the challenge of having enough planning time to implement this type of pedagogy. For example, in this study, large amounts of data needed to be tabulated and analysed quickly to effectively design differentiated learning experiences for student's individual learning needs. Designing several pathways to access information may prove particularly difficult for coordinators of visual art subjects, as they are generally run for shorter periods than most others subjects offered in the School of Education.

The time-consuming nature of the task should, however, be somewhat reduced on the second application of a differentiated framework of instruction. While two cohorts would never be identical, the conceptual framework would remain the same. This means the pre-tests, as well as pre- and post-subject surveys would not need to be rewritten. Subject content and delivery of instruction have also already been intentionally modified to cater to diverse learning profiles and readiness levels. Thus, while readiness levels and learning profiles may fluctuate, the content has already been adapted to suit the diverse learning needs of students entering the visual art subject.

This study does have its limitations in that there was no control group, as all the generalist pre-service teachers were taught using the differentiated-instruction approach. However, a study by Chamberlain and Power (2010) was conducted in the United States in which part of a cohort was taught using a differentiated-instruction approach, while the other half using the traditional approach. The group that received differentiated instruction scored higher than the control group in the post-subject test. Students in this group also perceived that they were better supported in their learning. Further research is needed in other disciplines to better understand the impact of differentiation at the tertiary level.

To ensure that these generalist pre-service teachers' perceived confidence levels and value for authentic art education continues to remain positive, they will need to be further supported once they have their own classrooms. Educators at every level of the Australian education system need to take positive steps in this direction. Not to do so will allow this cycle of neglect regarding visual art education in Australian primary schools to continue in the years ahead.

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Appendix A: Self-Completion Surveys

Self-Completion Survey 1

Please read and answer the seven questions listed below

1. Readiness level: When did you last participate in a visual art course?
- Below grade 8
- Grade 8
- Grade 10
- Grade 12
- Post-school

2. *a) Rate your confidence level to teach visual art at the primary school level from 1-5, one being the least confidence and five being the most confident on the continuum.*
- 1
- 2
- 3
- 4
- 5

   (b) Please explain why you feel this way.

3. *Rate your confidence in your ability to plan an authentic visual-art program at the primary school level from 1-5, one being the least confidence and 5 being the most confident on the continuum.*
- 1
- 2
- 3
- 4
- 5

4. *Interest: What visual-art areas are you particularly interested in:*
- Printing
- Graffiti
- Drawing
- Sculpture
- Painting
- Photography
- Other_____

5. *Interest: Do you have any specific artists (e.g. Andy Warhol) or artistic movements (e.g. Pop Art etc.) that you are interested in learning about?*

6. *Learning profile: Circle all the suggestions that you perceive reflect how and where you like to learn best:*
- In the lecture hall
- Workshop

- Both: lecture hall and workshop
- Noisy setting
- Quiet setting
- In groups
- Individually
- In pairs
- Whole to part
- Part to whole

7. *Learning profile continues: Would you say you were a:*
- Visual learner
- Auditory learner
- Kinaesthetic learner

Self- Completion Survey 2

Please read and answer the two questions listed below.
1. (a) Rate your confidence level post-course to teach visual art at the primary-school level from 1-5, one being the least confident and five being the most confident on the continuum.
- 1
- 2
- 3
- 4
- 5

(b) Please explain why you feel this way.