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# The Transformation of Queensland JuniorSecondary School Manual Arts into Technology Education: A Qualitative Analysis of the Teacher's Role

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In Queensland, changing Manual Arts and implementing a Technology Education curriculum in a systemic manner has proven to be problematic. A core group of progressive teachers has been responsible for non-systemic changes in the curriculum in some schools. The study reported here used qualitative research methods to investigate the factors which have influenced those teachers to change the curriculum. Narrative interviews were conducted with five teachers and analysis of the data has revealed five significant factors: flagging student interest, external curriculum, supportive school environment, personal renewal and leadership style. An emergent model of curriculum change has been identified and recommended for further research.

## Introduction

The Industrial Technology and Design Teachers' Association of Queensland (INTAD) believe that the successful implementation of new technology education focused syllabi is at risk because there is a "lack of Education Queensland direction and policy" (INTAD 2001, p.1). The introduction of school-based management has decentralised the implementation of syllabi. Principals now place new expectations of professionalism on teachers to provide quality learning for students which reflect new syllabus direction. Currently however, in many schools the Manual Arts curriculum reflects a pre 1986 manual training orientation (Warner 2001).

Manual Arts teachers have adopted a "wait and see approach" (INTAD 2001, p.2), and are expecting a systemic curriculum direction, professional development and the provision of resources (Warner 2001). These teachers are now "at the extreme edge of knowledge and understanding of the content and pedagogical philosophy for the delivery of new technology curriculum" (INTAD 2001, p.2). Failure to implement the new curriculum may jeopardise the future viability of the subject area as there is no statutory obligation for schools to offer subjects in the Industrial Technology and Design.

A core group of progressive teachers, approximately 40 from a total cohort of about 1150 (Warner 2001), have personally chosen to implement a school based technology curriculum. These teachers have modified the existing shop-based syllabi and pre-empted

the new technology curriculum (INTAD 2001; Warner 2001). This situation poses a question that has formed the basis of this research. What factors have influenced Queensland junior secondary school Manual Arts teachers to implement a Technology Education curriculum?

### **Literature review**

Historically, changes in Queensland Manual Arts curriculum have only been successful when initiated by classroom teachers (Waltisbuhl 1995). Green (1986) supports this view but adds that a new curriculum is not implemented in Manual Arts because the "teachers' attitudes are steeped in prescriptive methods derived from nineteenth century practice" (Green 1986, p.27). "These attitudes have to be challenged and shown to be inadequate to the current situation and new-ideas, programs and practices that are meaningful, feasible, and useable have to be proposed" (Bybee & Loucks-Horsley 2000a, p.16).

Researchers have found that in the implementation of systemic educational reforms, the attitude of the classroom teacher is crucial in determining the success or failure of innovative curriculum (Hargreaves 1994; Sarason 1991). To successfully implement changes, teachers must agree with the underlying philosophy of the curriculum (Stein, McRobbie & Ginns 1999). Changing a teacher's philosophy requires teacher development, which is a career - long process (Brady & Kennedy 1999). Without teacher development there is no curriculum development and, conversely, where a curriculum has changed, there has been teacher development (Givens 2000).

Implementing teacher development strategies is problematic. Teachers acknowledge the existence of programs, policy, directives, school regulations and recommendations but in practice, they often feign what needs to be done to comply with requirements. The curriculum students actually receive is more influenced by what teachers believe, by what peers believe and do, and by other more elusive cultural matters. (Sergiovanni 1996; Wallace 1998).

Hargreaves (1997), has proposed that theories of educational change have been ineffective because they focused on technical planning. These theories of educational change were developed within a positivist epistemology that provides " a set of logical rules of explanation, independent of the world and its social practices" (Usher, Bryant & Johnston 1997, p.176). The social aspects of change are therefore ignored. Support for new theories of educational change is based on a conceptualisation of social reality which recognises knowledge as personal, subjective, and as being developed and interpreted within a unique social context (Cohen & Manion 1994). Researchers in education (Evers & Lakomski 1996) are using this understanding of social reality to justify methods of research into the relationships of participants rather than the technical components of an educational social system. This research is grounded in the real-world experience of teachers, students and administrators and their social reality. The approach is interpretive, the analysis of the data is inductive, with theory being emergent and not preceding the research (Cohen & Manion 1994).

This grounded approach to research was seen as being appropriate for investigating the problem presented in this project. The literature review revealed a gap in the knowledge in regards to factors which influence teachers to change curriculum content

and practice. Using a grounded research approach provided an opportunity to discern some of the elusive attitudes, beliefs and cultural matters which influence teacher development and therefore their role in the change process. Focusing the research on the Queensland junior secondary school, Manual Arts teachers who have implemented a Technology Education curriculum was seen as best involving a reflective investigation of the factors which have influenced the change. An ethnographic methodology was deemed to be appropriate with data collection through narrative interviews.

## **Methodology**

### **Narrative interviewing**

In the context of this project, narrative interviews were in the form of an unstructured discussion focusing on the research question. The participant was encouraged to narrate the story of their experiences during the period when they were changing the curriculum. The unstructured interview creates a conversational encounter which allows the interviewee to tell a story in their own way and the interviewer the freedom to respond to new material raised during the interview.

Participants were selected from a list provided by the Industrial Technology and Design Teachers Association (INTAD) of exemplar technology teachers involved in new curriculum implementation. From this list five teachers were chosen who were also involved in the QSCC Technology KLA trial. These teachers had voluntarily implemented a Technology curriculum prior to being invited to apply for involvement in the syllabus trial and their programs were used as the basis for the initial in-service materials. Data were collected from each participant in their own school environment using an audiotape.

### **Data analysis**

The data obtained from each participant was initially read and studied to obtain a 'feel' for the individual's story. Each participant had recorded a brief resume and this was used as the basis for a descriptive profile which outlined their career and the process by which they had experienced curriculum change. The finished profile was emailed to the participants and their feedback sought to ensure that they were not being misrepresented. As a result of completing the profile a much deeper understanding of the unique themes and issues within each individual's interview data was gained.

The next step in the analysis of the data involved an inductive two-stage process. Firstly, a list of the frequently recurring themes and issues was prepared for each individual. The groups of supporting text for each theme and issue were categorised and labelled as 'factors'. The result of this process was a new document featuring a set of factors which had influenced the participant along with supporting extracts from the interview data. This was repeated for all the participants, one at a time and without reference to one another to minimise influence from previous data.

The second stage of the analysis involved identifying and labelling factors which were common to a number of participants. These were then documented in a narrative format and illustratively grounded in as much supporting raw data as possible. The factors were

subjected to an extensive literature review to ascertain whether or not a relationship existed between the identified factors and any existing theory. From the relationships between the factors, an emergent model of curriculum change has been proposed.

### **The factors**

A factor, in the context of this study, is an influence which existed prior to the change and therefore influenced the teacher to initiate the change process.

#### **Flagging student interest**

"Flagging Student Interest" influenced the teachers' decision to maintain or change the current curriculum. The participants described a process whereby a lack of student interest in a subject initiated change, the students' needs tailored the new curriculum and once a new curriculum was implemented the students' enthusiasm provided the impetus for the ongoing change process. Stein, McRobbie and Ginns (1999) proposed that before teachers fully embrace the new beliefs and practices of technology curriculum, they need to experience the value through the changes in student learning. In this project the students' change from boredom with the traditional program, to a positive response to the technology curriculum, has encouraged the teachers to rethink their attitude to existing curriculum.

#### **External curriculum**

"External Curriculum" influenced the participants to adopt a Technology Education focus to the curriculum change that they planned. At the time that the participants were initiating curriculum change, the only syllabi in the Manual Arts area were the 1986 traditionally based Shop A and B. The documents that influenced the teachers and provided a technology direction included the Technology Key Learning Area statements, overseas curriculum and senior school syllabi such as Technology Studies.

This exposure to external curriculum was by accident rather than design but the effect fits with Fullan's (1999) top/down and bottom/up strategies of change. Fullan states that there has to be a simultaneous operation initiated of systemic policy and classroom innovation. In this study the external curriculum has influenced the teacher at a time when other factors such as flagging student interest were present. This may explain why the fragments of external curriculum have contributed to the actions of these teachers in changing the traditional curriculum.

#### **Supportive school environment**

"Supportive School Environment" describes the internal school political milieu that has supported and encouraged the participants' to change the curriculum. The contributors to this environment are the Principal, Head of Department, Manual Arts staff, School council and parents. The nature of the school environment has affected all of the participants. Some of them had tried to implement changes at previous schools but were unsuccessful because of a hostile or apathetic attitude to the new subject direction. The main underlying theme that the participants describe involves the administration giving the teacher the freedom to change.

An investigation of the literature from previous research indicates that a supportive school environment is a fundamental requirement for the successful implementation of new curriculum (Bybee & Loucks-Horsley 2000a; Penney & Fox 1997). This environment includes time, materials, organisational structures which encourage people with ideas, and collaborative opportunities for professional dialogue (Penney & Fox 1997). These strategies, especially opportunities for professional dialogue and structures that encourage ideas, would allow teachers "freedom" similar to that described by the participants in this project.

Peer support is a factor which is well documented in previous research. The attitude of the classroom teachers defines the day to day environment in which the innovative teacher works. As Givens (2000) states "innovation cannot succeed unless the majority of staff are at worst neutral but it is clearly important to have a majority positively inclined to the curriculum change" (p.74). This is particularly so in the case of a Head of Department. When they provided a supportive environment, the teachers began to change the curriculum.

#### **Personal renewal**

"Personal Renewal" describes a process of personal reflection and development which changed the teacher's belief in Manual Arts. The result was a philosophical shift towards the ideals of Technology Education prior to implementing changes to the curriculum. The process was induced by separate elements such as, career dissatisfaction, the influence of peers or mentors, further study and spiritual enlightenment.

Four of the participants were all trained as traditional Manual Arts teachers and were not exposed to the elements of personal renewal until they had been teaching for at least 15 years. They reported experiencing a period of dissatisfaction with their job and the subject area, which led to a phase of personal reflection. Bascia (1998), maintains that teachers experience four distinct phases of personal growth as they progress through their career. When teachers enter the profession they are initially concerned with survival. Subsequently they question their suitability to the career. Once these concerns are satisfied they enter a third phase where they look for ways to improve their teaching ability. In the fourth phase they experience a desire to influence other teachers. Effective teacher development usually takes place in a teacher's third phase of personal growth. It involves the teacher challenging their old beliefs and forming new beliefs, developing knowledge and learning new skills (Bybee & Loucks-Horsley 2000b). This is the process of personal renewal described by each of the experienced teachers.

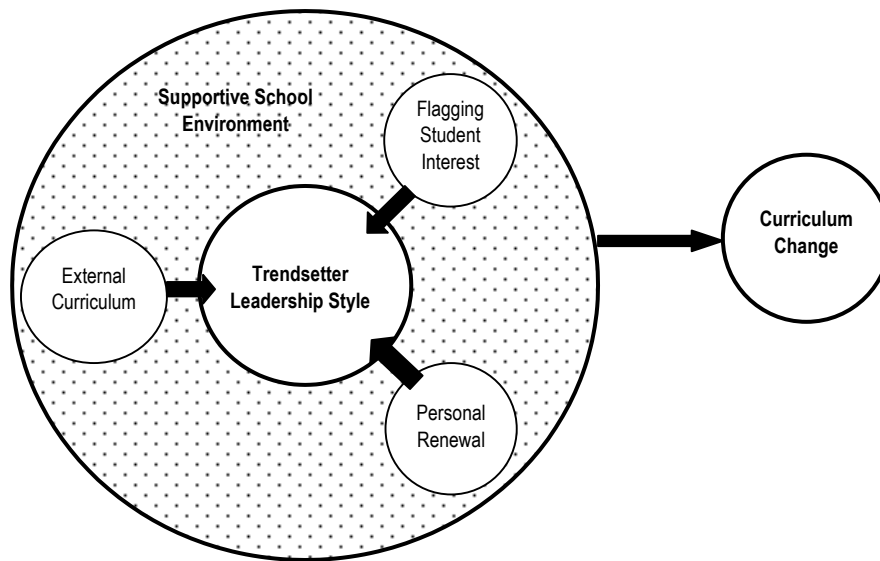
#### **Leadership style**

"Leadership Style" describes the personal characteristics which dictated the response of the participants when acted upon by the other factors. This factor emerged from the data as a dual factor as two different forms of leadership were apparent, "Trendsetter" and "Promoter." A trendsetter in this context is a person willing to accept new ideas and implement them when no one else is interested and set an example through direct leadership that others follow. Four of the participants, all acted as trendsetters in the manner in which they have implemented the Technology Education curriculum.

The Promoter leadership style describes one participant's approach to the change process. His leadership style emerged from the data as a supporter of change rather than a driver of change. He allowed the teachers freedom to initiate new curriculum and proactively lobbied the school administration to change the perceptions and attitudes to the subject area. He continually used the term "We" and credits the changes that have occurred as being a result of a collaborative effort. As a result of his leadership style, he has created a supportive school environment which is one of the key strategies for educational change in schools (Fullan 1998).

### Emergent model of curriculum change

The four factors, flagging student interest, external curriculum, supportive school environment and personal renewal form a system of change which has influenced the participants to introduce a non-systemic curriculum change. The factors are interrelated and have provided a simultaneous influence on the participants. Further investigation of the data revealed that the participants' leadership style contributed to this phenomenon and forms the nucleus of an emergent model of curriculum change in Technology education. The model was labelled the, "Trendsetter model of non-systemic curriculum change in Technology education," vide figure 1.



**Figure 1**

Trendsetter model of non-systemic curriculum change in technology education

Flagging student interest raises the trendsetter teacher's awareness that there is a problem with the existing subject while personal renewal provides the process of teacher development that is required for them to begin to question their belief in Manual Arts. A trendsetter teacher influenced by flagging student interest and undergoing a personal renewal is searching for a direction of action which will meet the needs initiated by these factors. Exposure to external curriculum focuses their energy on the curriculum change process. When these three factors are simultaneously influencing the trendsetter teacher, a desire to change the curriculum is initiated. Teachers influenced in this manner require a supportive school environment, which may be provided by the existence of a promoter style leadership, before they are able to successfully implement curriculum change. This environment must allow the teacher freedom to explore and trial new curriculum directions.

### **Conclusions and recommendations**

This project aimed to define the factors which have influenced Queensland junior secondary school Manual Arts teachers to implement a Technology Education curriculum. Five important factors emerged from an analysis of narratives. These were, flagging student interest, external curriculum, supportive school environment, personal renewal and leadership style. Two leadership styles were evident, trendsetter and promoter. The trendsetter leads by implementing the curriculum personally, whereas the promoter leads by supporting other teachers and encouraging them to implement changes.

As an outcome of the research an emergent model of curriculum change has been proposed. The trendsetter model of non-systemic curriculum change in Technology Education hypothesises that a teacher with a trendsetter leadership style, when influenced by flagging student interest, external curriculum and personal renewal, will implement a curriculum change if they are in a supportive school environment.

The research has also identified two factors, personal renewal and supportive school environment, which could be developed to assist teachers' receptivity to the change process. Effective personal renewal may be initiated by the provision of a sustained period of professional development. A supportive school environment may be enhanced by the employment of a teacher, preferably the Head of Department, whose leadership style is that of a promoter. The conclusions and proposed model provide future researchers and practitioners with context-relevant data which may be used for the basis of further research.

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