INTRODUCTION

The question of individual differences

Educators have become increasingly conscious of the need to explore and explain the multiple factors affecting the learning outcomes of students. Whether a student comes from school or the work place, adjustment to university involves changes in almost every aspect of an individual's life. Physically the environment can be overwhelming leading to a sense of disorientation, isolation and loneliness (Faiers, 1997). Academic demands challenge students to work often on their own in a way that has never been expected of them before. Cognitively there are demands made on a student that are based on untested assumptions of learning styles. When analysing student outcomes, research has tended to focus on student ability, needs and motives, the appropriateness of the curriculum or the nature of the educational process. More recently there has been an interest in the social/emotional experience of the first year student and the effects of interacting factors on both levels of satisfaction and attrition rates.

Rationale for the study

The College of Fine Arts began its life as an "Art" school, training students in either Visual Arts or Art Education - that is students intended to be practising artists or art teachers and these two degrees were relatively separate. In the last few years, degrees in Design and Art Theory have been added. However students in all degrees may share their studio classes and may share many of the elective history/theory subjects. The academic disciplines and demands of subjects vary as do student expectations of both their own obligations and those of the lecturers. Students are expected to ‘bounce’ from the more structured vocational discipline related theory classes to studio classes which often have very different methods of presentation, instruction and assessment.

The present project sprang from concern that many students did not seem to be coping well in both theory and studio work in spite of the fact that they were highly motivated, were diligent, had scored more than satisfactorily in the Higher School Certificate and had an acceptable standard of practical skills as evidenced in their entry portfolios. Attrition rates were of concern. The question arose: is it the course, the students, the lecturers or a mismatch of expectations, student types, teaching styles and learning styles that causes anxiety, lack of confidence or disenchantment amongst students? This paper reports a pilot study that explored the evidence and implications of such potential mismatch.
DIFFERENT LEARNING APPROACHES - THEORY

Biggs’ 3P Model

In an attempt to integrate traditional factors and intra-personal characteristics involved in the processing of information, Biggs(1987) proposed a model of learning that relied on presage, process and product factors. Where presage factors concern all typical characteristics of the student, teacher and curriculum and product factors are primarily concerned with the outcomes of learning, process factors are those processes that student and teacher engage in to approach their learning tasks. Process factors include the means of adaptation and assimilation of the learning demands in terms of an individual’s own needs, goals and motivation. So learning outcomes can be seen to be easily confounded by student approaches where motivation and strategies are ill suited to the particular goals of either the student or lecturer.

Biggs (1987) further proposed three prototypical process approaches to learning based on motivations and strategies: the surface, deep and achieving approaches.

The surface approach is dependent on the extrinsic motivation used by individuals to allow them to complete a task. It does not demand necessarily any intellectual or emotional input from the individual in terms of personal investment; learning is seen as a means to an end rather than as something intrinsically important for its own sake.

The deep approach is based on a ‘qualitative conception’ of learning rather than a ‘quantitative conception’ (Entwistle (1990). Rather than concern with reaching an end, it is concerned with underlying philosophies and concepts. The deep approach learner is more concerned with personal exploration rather than teacher instruction.

Whilst the surface and deep approaches are, to an extent, opposite means of achieving a goal, the achieving approach is dependent on the importance of the goal. This importance is not just in terms of the ‘usefulness’ of the end but in terms of the ego-enhancing nature of potential success. The achieving approach learner is therefore more likely to be more disciplined in what is important to achieve success rather than what is important to reach the target.

Biggs argues that how a student will perform is dependent on which of these approaches the individual uses in the perception of the task, the setting of goals, the motivation to achieve them and the processes activated to approach the task. As Shuell (1986: 429) states: “the learning related reactions of the students are more important in determining the nature of the learning process than the teacher presentation of material”. This is supported by the research of Murray-Harvey(1995) which found that while the approach to learning as measured by the Biggs’ (SPQ Scale) did not directly influence achievement it had an indirect effect through its effect on metacognitive capability including awareness and control of the learning process.

THE MYERS-BRIGGS TYPE INDICATOR (MBTI)

Accepting that students use different approaches begs the question of whether there is a ‘type’ of personality that underpins learning approaches. Hence there has been growing interest in models which explore the relationship of learning styles and preferred personality type. The Myers-Briggs Type Indicator, based on the personality theories of Jung, is not a typical personality measure. It is an indicator of an individual's preferred mode of functioning in their environment. It is not just another measure of personality. Indeed it can be criticised for a lack of specificity in construct that is available in scales such as the NEO Personality
Inventory. It is not a diagnostic tool. Its great merit, however, lies in its ability to give a global picture of the way particular types are more likely to operate in their environments.

It is concerned with the ways individuals perceive the world measured on the Sensing/Intuition continuum (S-N) and the ways individuals function measured on the Thinking/Feeling continuum (T-F). These preferred modes of functioning patterns are seen in relation to two other aspects of type which are often seen not as functions but as attitudes or orientations. The source of our energy and the direction of the flow of attention and energy in the individual’s world is measured on the Extraversion/Introversion scale (E-I) and the propensity for decisiveness and the degree to which an individual prefers closure is measured on the Judging/Perceiving scale (J-P).

The Myers-Briggs Type Indicator (MBTI) and Career Choice.

In the first instance the four preference dimensions (E/I, S/N, T/F and J/P) have been used in this study to compare the different student groups tested with the evidence of existing occupation-type data (Myers and McCaulley, 1990). This data is not based on student preferences but on those already in different professions. This raises questions as to the validity of the comparisons. However if one assumes that there are matches that would be accepted, then the causes and consequences of mismatches would be seen to be worth pursuing.

It seems that the two dimensions most concerned with determining the type of preferred activities and hence degree and career choice are the S/N and J/P dimensions. The Myers & McCaulley data (1990) indicates approximately 50% of teachers in general will be Sensates (S), compared to only 14% of artists. Thus, teachers in general are more likely than artists to conceive their world through the five senses. This allows them to be more anchored in the reality of the outer world, to be more ordered and more attentive to detail.

On the other hand, artists are more likely to react through intuition (N) and so to be more alert to possibilities than realities and to be more receptive to hunches. Similarly there is also a difference in the way teachers, and artists function on the fourth dimension - the mode of decision making. Typically high school teachers (68%) operate on the Judging (J) side of the continuum compared with only 39% of artists.

These differences raise important implications for the art student, the teacher of art and the trainee art teacher who may make unfounded assumptions about the role of ‘art’ in the particular degree and vocation chosen. It also raises the question of how important is the use of Sensing or Judging functions for all teachers, including art teachers and how important is the use of Intuition and Perceiving to all artists even though they are teachers?

GENERAL RESEARCH PROBLEM

The general aim of the pilot study was to explore the relationships between personality type as measured by the Myers Briggs Type Indicator, the choice of degree, learning styles, anxiety, and career decision making. The study was based on the premise that if approaches to learning are the result of type, then it is likely that anxiety will result when the particular learning strategies used are inappropriate to the demands of the particular subjects being studied. If anxiety is thus aroused then it would seem likely that an individual will experience doubts as to the wisdom of their course/vocation selection. This paper reports the initial findings of a pilot study designed to ‘map’ the first year student population in one faculty.
Research Questions

1. To assess the frequency of each ‘personality’ type in each degree in the faculty according to the Myers Briggs Type Indicator (MBTI).

2. To question the Myers Briggs Type Indicator (MBTI) hypothesis that type will have an impact on tertiary degrees chosen. That is, students will opt in the first instance for degrees that are most sympathetic to their MBTI type.

3. To discover any relationships between different MBTI types and approaches to learning.

4. To identify relationships between MBTI types in particular degrees and anxiety.

5. To explore the possible effects of MBTI types in conjunction with degree chosen on anxiety and career indecision.

6. To propose a possible model of interrelationships between MBTI types, learning approaches, degrees chosen, anxiety and career indecision.

METHODOLOGY

Subjects

The subjects included volunteer first year students in the four degrees offered at that time at the College of Fine Arts, University of New South Wales: students in the Bachelor of Art Education, the Bachelor of Art Theory, the Bachelor of Fine Arts and the Bachelor of Design. All students who volunteered were included in the survey. Of the total numbers enrolled in the first year of degrees (approximately 300) the number completing the battery of tests was 160.

Methods of Assessment, Relevant Scales and Data Analysis

1. Individual type was assessed using the Myers-Briggs Type Indicator (MBTI) Form G which is a self-report forced-choice questionnaire. While type profiles are expressed in letter form, the test also provides a means by which continuous scores can be converted form preference scores. This conversion to a continuous scale is designed for the purposes of correlational research and thus allows analysis of the direction of relationships.

2. Anxiety was measured using the State-Trait Anxiety Inventory (STAI) - Form Y which is a two part scale devised by Spielberger (1983) that measures both state and trait anxiety. In this study only the STAI S-Anxiety Scale was used yielding a single score representing currently felt levels of tension, apprehension, nervousness or worry.

3. Career Decision was assessed using Career Decision Scale which is a self report scale developed by Osipow et al (1986).

4. Approaches to learning in theory subjects were assessed using the Study Process Questionnaire, a scale developed by Biggs (1987) consisting of 42 items on a 5 point Likert Scale.

5. Approaches to learning in studio/practical subjects were measured by using the Studio Process Questionnaire , an adaptation of the Study Process Questionnaire

All tests (except the Processes of Learning in Studio and Practical Subjects) are standardized tests. No accurate measure of the study demands of each degree was gained and certain assumptions were made according to the vocational/non vocational orientation of the degrees.
Descriptive data was gained concerning characteristics of students in each course in terms of age, sex, years out of school, first choice of degree and their outside involvement in art related work.

RESULTS

Relationship between type and course selection

Table 1 represents frequency distributions of types in each degree. In brackets below the current data are the percentages of individuals in similar vocational groups as quoted in the Myers-Briggs Data Bank (Myers-Briggs and McCaulley, 1990).

<table>
<thead>
<tr>
<th>Degree</th>
<th>% E</th>
<th>% I</th>
<th>% S</th>
<th>% N</th>
<th>% F</th>
<th>% T</th>
<th>% J</th>
<th>% P</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. ArtTh (Writers)</td>
<td>63.6%</td>
<td>36.4%</td>
<td>18.2%</td>
<td>81.8%</td>
<td>63.6%</td>
<td>36.4%</td>
<td>45.5%</td>
<td>54.5%</td>
</tr>
<tr>
<td>(51%)</td>
<td>(14%)</td>
<td>(86%)</td>
<td>(59%)</td>
<td>(41%)</td>
<td>(39%)</td>
<td>(61)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Des (Designers)</td>
<td>33.3%</td>
<td>66.7%</td>
<td>22.2%</td>
<td>77.8%</td>
<td>44.4%</td>
<td>55.6%</td>
<td>44.4%</td>
<td>55.6%</td>
</tr>
<tr>
<td>(55%)</td>
<td>(45%)</td>
<td>(58%)</td>
<td>(56%)</td>
<td>(44%)</td>
<td>(56%)</td>
<td>(56%)</td>
<td>(44%)</td>
<td></td>
</tr>
<tr>
<td>B.Art Ed (HS Teachers)</td>
<td>52.5%</td>
<td>47.7%</td>
<td>12.5%</td>
<td>87.%5</td>
<td>65.6%</td>
<td>35.0%</td>
<td>37.5%</td>
<td>62.5%</td>
</tr>
<tr>
<td>(50%)</td>
<td>(50%)</td>
<td>(50%)</td>
<td>(50%)</td>
<td>(58%)</td>
<td>(42%)</td>
<td>(68%)</td>
<td>(32%)</td>
<td></td>
</tr>
<tr>
<td>B.F.A (Artists)</td>
<td>40.2%</td>
<td>59.8%</td>
<td>17.1%</td>
<td>82.9%</td>
<td>53.7%</td>
<td>46.3%</td>
<td>23.2%</td>
<td>76.8%</td>
</tr>
<tr>
<td>(49%)</td>
<td>(51%)</td>
<td>(14%)</td>
<td>(86%)</td>
<td>(59%)</td>
<td>(41%)</td>
<td>(39%)</td>
<td>(61%)</td>
<td></td>
</tr>
<tr>
<td>Total COFA%</td>
<td>43.8%</td>
<td>56.3%</td>
<td>16.9%</td>
<td>83.1%</td>
<td>55.6%</td>
<td>44.4%</td>
<td>31.9%</td>
<td>68.1%</td>
</tr>
</tbody>
</table>

It seems that while there is a disproportionate number of Intuitives in the College this is not unexpected when compared with similar populations. However this imbalance is exaggerated amongst B.ArtEd and B Design students with a commensurate drop in the Sensing percentages. Converting these individual preference to type dominant scores, Table 2 reports the frequency of dominant types in each of the four degrees.

<table>
<thead>
<tr>
<th></th>
<th>B. Art Th</th>
<th>B. Design</th>
<th>B. Art Ed</th>
<th>B. Fine Arts</th>
<th>Type % Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling Dominant</td>
<td>27.3%</td>
<td>25.9%</td>
<td>20.0%</td>
<td>28.0%</td>
<td>25.6%</td>
</tr>
</tbody>
</table>
From this data it can be seen that the most Dominant type in all courses is the Intuitive student. The breakdown of dominant type per degree indicates that:

(i) Sensing dominant types are more represented in the degree of Education and Design (the vocational degrees) than either Fine Arts or Art Theory.

(ii) Intuitive types are over represented in all course but are in fact marginally less represented in Fine Arts than the other degrees which was not anticipated. The importance of this will be seen when making an analysis of career commitment in relation to type Dominance

(iii) Thinking dominant students are relatively evenly distributed amongst the degrees but are most represented in the Fine Arts course which was not predicted. One of the two courses predicted by Myers-Briggs and McCaulley, 1990, to be more likely to have a greater number of Thinking dominant students - the B.Design, - has the second lowest proportion of these students.

Possible explanations for these differences may rely on different perceptions of the ‘art’ aspects of each of the courses and fears concerning the vocational viability of degrees. Thus the Intuitive dominant student in the Bachelor of Education may have chosen the degree not because they wanted to be a teacher per se but rather concentrated their attention on the ‘art’ aspects of the course. Similarly the lower ratio of Thinking dominant students in the Design course may indicate a desire to follow a vocational degree in spite of a personality type preference for art related activities. It would be worth while in later studies to explore such propositions through student interviews and focus groups.

**Relationship between MBTI type and the Biggs learning approaches**

Correlational analysis of Learning Approaches (Biggs) and the MBTI four continuous dimensions are shown in Table 3. It looks at Surface Approach in both theory subjects (SAT) and studio subjects (SAS), Achieving Approach in both theory and studio subjects (AAT and AAS), Deep Approach in both theory subjects (DAT) and studio subjects (DAS) and a combined Deep Achieving Approach in theory (DAAT) and Studio (DAAS) subjects. It is important to note that the negative sign here is indicative of which direction the relationship lies on continuous scores for the E/I, S/N, T/F and J/P dimensions. Positive correlations refer to ‘I’ ‘N’ ‘F’ or ‘P’ and negative correlations refer to ‘E’ ‘S’ ‘T’ or ‘J’.

<table>
<thead>
<tr>
<th>Intuition Dominant</th>
<th>45.5%</th>
<th>40.7%</th>
<th>47.5%</th>
<th>39.0%</th>
<th>41.9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing Dominant</td>
<td>9.1%</td>
<td>14.8%</td>
<td>12.5%</td>
<td>9.8%</td>
<td>11.3%</td>
</tr>
<tr>
<td>Thinking Dominant</td>
<td>18.2%</td>
<td>18.5%</td>
<td>20.0%</td>
<td>23.2%</td>
<td>21.3%</td>
</tr>
</tbody>
</table>

Table 2: Dominant Preferences Represented in Each Degree
Table 3 Correlation of basic type according to the MBTI and learning approach

<table>
<thead>
<tr>
<th></th>
<th>SA (Th’y)</th>
<th>DA (Th’y)</th>
<th>AA (Th’y)</th>
<th>DAA (Th’y)</th>
<th>SA (Stud)</th>
<th>DA (Stud)</th>
<th>AA (Stud)</th>
<th>DAA (Stud)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-I</td>
<td>-.05</td>
<td>.14</td>
<td>.01</td>
<td>.12</td>
<td>.01</td>
<td>.11</td>
<td>.02</td>
<td>.06</td>
</tr>
<tr>
<td>S-N</td>
<td>-.44**</td>
<td>.20*</td>
<td>-.15</td>
<td>.06</td>
<td>-.43**</td>
<td>.35**</td>
<td>.00</td>
<td>.18*</td>
</tr>
<tr>
<td>TF</td>
<td>.05</td>
<td>.02</td>
<td>.01</td>
<td>.01</td>
<td>.02</td>
<td>.11</td>
<td>.03</td>
<td>.08</td>
</tr>
<tr>
<td>J-P</td>
<td>-.17*</td>
<td>-.00</td>
<td>-.23**</td>
<td>-.12</td>
<td>-.19*</td>
<td>.14</td>
<td>-.16*</td>
<td>.02</td>
</tr>
</tbody>
</table>

* - Signif level p < .05 **- Signif level p < .01 (2-tailed)

Where: + = ‘I’ ‘N’ ‘F’ and ‘P’
- = ‘E’ ‘S’ ‘T’ and ‘J’

It is evident here that the two dimensions that are important in relation to type preference and learning approach according to Biggs’ Scale are the Sensing-Intuition continuum and the Judging-Perception continuum. As Sensing increases so too does the likelihood of a Surface Learning approach. This table also indicates the role the preference for Judgement plays in relation to Surface and Achieving approaches in both theory and studio subjects.

Further regression analyses of the two continuums: Sensing-Intuition and Judging-Perception, in conjunction with each of the possible learning approaches in both theory and studio subjects indicated relationships which are summarised in Table 4.

<table>
<thead>
<tr>
<th>Type</th>
<th>Learning approach</th>
<th>Signif F</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing</td>
<td>Surface in Theory</td>
<td>0.0000</td>
<td>p &lt; .000 ***</td>
</tr>
<tr>
<td>Intuition</td>
<td>Deep in Theory</td>
<td>0.0065</td>
<td>p &lt; .01 **</td>
</tr>
<tr>
<td>Sensing</td>
<td>Surface in Studio</td>
<td>0.0000</td>
<td>p &lt; .000 ***</td>
</tr>
<tr>
<td>Intuition</td>
<td>Deep in Studio</td>
<td>0.0000</td>
<td>p &lt; .000 ***</td>
</tr>
<tr>
<td>Judging</td>
<td>Achieving in Theory</td>
<td>0.013</td>
<td>p &lt; .05 *</td>
</tr>
<tr>
<td>Judging</td>
<td>Achieving in studio</td>
<td>0.0405</td>
<td>p &lt; .05 *</td>
</tr>
</tbody>
</table>

Table 4 Regression relationships between Types (MBTI) and learning approaches (Biggs’ 3P Model)
Therefore, *Sensates* are significantly more likely to use *Surface Approaches* in both theory and studio subjects than any other Type preference. The *Intuition function* is associated with a *Deep approach* in theory subjects at a .01 level but in Studio subjects is highly significant at .000, while *Judging* is associated with an *Achieving approach* in both theory and studio work.

**Relationship of Degree Being Undertaken and Learning Approaches**

Before exploring intervening or confounding variables that might affect learning styles (approaches), it is worth analysing the basic relationship between learning styles and the choice of degree. A Wilks multivariate analysis with degree choice as the dependent variable and learning approaches as the independent variables resulted in the effects of Degree on Learning Approaches to be at a significance level of .001**(p<.01)**. It seems then, that there is a relationship between students in particular degrees and their mode of approach to study. The next question is whether these differences might be linked to their MBTI type.

**Relationship of Type, Learning Approach and Degree Chosen.**

In order to determine if the choice of degree is a moderator in the relationship between learning style and MBTI typology, the variables of Degree being undertaken and Dominant Types were used as a conjoint factor. A MANOVA with learning approaches being the dependent variables and joint degree/dominant type as the independent variable yielded the effect of this combined independent variable on surface approaches in theory :F=1.84 and sig of F= .035*. This suggests that a *Sensing Dominant* student is most likely to use surface and achieving approaches regardless of the degree chosen. The effect of this on anxiety will be discussed later.

However the fact that students in the B.Art Theory scored both the highest and lowest mean scores on the surface approach in studio subjects indicates that it might not be the type or the degree alone that determines learning approach.

Whilst a MANOVA revealed no significant statistical differences between these groups, it is interesting to note that students in the two degrees that are least ambiguous in their focus tend to use approaches that match the traditional expectations concerning those degrees. Thus, a low surface approach in theory work is most often used by students in the B.Fine Arts, while these students use a deep approach in studio work. As well, students in the B.Art Theory, a degree predominately concerned with theoretical writing, are most likely to use a deep approach in theory work.

Of more concern is the evidence that *Surface approaches in theory and studio subjects are most used by B.Art Education and B. Design students*. Furthermore Education students are not likely to use an *Achieving approach* at all. This questions the intrinsic motivation of these students and suggests the effect of choosing a vocational path when personality type (Intuitive dominant) might suggest a less structured degree could be more suitable. They are also the two courses that might lead to mismatched expectations amongst students of particular types because the mix of theory and studio practice is more confused.

**ANXIETY**

**The Relationship between Degree and Anxiety.**

It is important to note at the outset that anxiety was not explored in this initial analysis from a clinical perspective. As a pilot study it simply looked at total score levels. As well only *State anxiety* was recorded. The mean Anxiety score for all the students in the four degrees was
The B.Art Theory had the lowest mean at 33.09 and the B.Fine Arts had the highest mean at 40.15. On the basis of this, a T-test was used to calculate the degree of significance between these means. A Pooled Variance Estimate (2-tail T-Test) gave: a 't' (df,89)=-2.01, Prob=.047 and therefore a significance of p<.05*, indicating that students in the B.Fine Arts are significantly more anxious than students in the B.Art Theory. A question not answered in this analysis but worth pursuing, is why students in the two vocational degrees show average anxiety levels as groups while the two non vocational degrees exhibit high or low anxiety, again raising the issue of the effects of student expectations on student performance. As well scores should be analysed for clinical significance.

**The Relationship between Anxiety, Type and Degree**

It was hypothesised that students with types atypical to their chosen degree would be more likely to suffer state anxiety problems than would 'type typical' students. 'Type typical' was based on the expected frequency of types for different professions gained from the Briggs-Myers and McCaulley data (1990) and referred to in Table 1. There was however an untested reliance on assumptions about the structured versus non structured nature of the vocational versus the non vocational courses in the faculty.

It is interesting that the highest mean score for anxiety was :Sensing Dominant in the B Fine Arts (X=44.571) and the lowest was Thinking Dominant in the B Art Th (X=15.50). This suggests support for earlier evidence that Sensates would be most likely to be mismatched in a course such as a studio based B Fine Arts whilst Thinking and Sensing dominant functions would make it easier for students in vocationally oriented degrees.

Further to this, an one-way analysis of variance Tukey-b test shows a significant difference between Thinking Dominant students in the B.Art Theory and Thinking Dominant students in the B.Fine Arts: df(15) F=1.9095 and F prob=.03* (p<.05) showing that the type typical Thinking Dominant students in a 'suitable' degree such as the B.Art Theory exhibit significantly less anxiety than do Thinking Dominant students who are not in an appropriate degree for their type, such as the B.Fine Arts.

The next analysis examined the influence of dominant Myers-Briggs type (Feeling, Intuitive, Sensory, Thinking) and Degree Choice (Non-vocational, Vocational) on State Anxiety. Levine’s test indicated that the homogeneity of variance assumptions were met ($F_{[1,150]} = 1.074, p = 0.36$). The analysis involved was examined with a 2x4 random effects ANOVA with planned comparisons between degree choices for each Myers-Briggs type. The results of the ANOVA with the dependent variable, State anxiety indicated that neither Type nor Degree choice alone have an influence on state anxiety. However the interaction between the variables was significant although the result was on the border of statistical significance at .050. The nature of the significant interaction is illustrated in Figure 1.
Figure 1: Relationship of type dominance, degree chosen and anxiety

The results show that students with a dominant Intuitive type are less anxious in non-vocational courses, which was supported by a planned comparison between anxiety levels in Intuitive students participating in different degrees ($F_{[1,150]} = 4.317, p < 0.05$). It is also suggests that Sensing students are less anxious in vocational courses. Whilst this result failed to achieve statistical significance ($F_{[1,150]} = 3.101, p = 0.08$), there were only 17 Sensing students in the sample. This result is likely to become significant in a larger sample of students.

But given the fact that sensing dominant students are in the minority in both the vocational degrees: education and design, then it would seem that there is a real potential for anxiety.

Relationship learning styles and anxiety

Multiple Regression analysis with Anxiety as the dependent variable and different learning approaches being the independent variables yielded only one significant relationship - that between Surface learning in Studio subjects and anxiety: $T(df=6) = 2.694$ with a significance of $0.0079^{**}$ ($p<01$).

Relationship between anxiety, type, learning approaches and degree.

It was thought that learning approaches, choice of degree and anxiety are inter-related, and that students with learning approaches that are inappropriate to their degrees would show more anxiety than those with learning approaches that are more suitable to their chosen degree. The evidence to support this proposition is indirect.

In this study there was no evidence of direct linear relationships between these variables or any interaction effects. But as Sensates are more likely to use a Surface approach and there is a relationship between Surface learning and Anxiety in studio subjects, this might be explained by the fact that anxiety is a result of the mismatch of type and learning styles needed for each degree. Thus it is more likely that anxiety be low when the degree chosen matches the type and the learning styles. For example one would expect:
• Sensing Dominant students in the B.F.A to experience high anxiety if their learning approach in Studio subjects is a Surface one.

• Thinking Dominant students in the B.Art Theory to experience low anxiety especially if the learning style is Surface. This is supported by the evidence that the lowest mean anxiety score (X=15.50) is Thinking Dominant in the B.Art Theory.

The inter-dependence of such relationships needs to be further analysed.

Relationship between anxiety and career indecision.

A Pearson Correlation yielded a co-efficient: r=.28, (p<.01**), indicating a corresponding increase in anxiety and career indecision. This does not, of course, indicate which causes the other.

DISCUSSION

Whilst there is a relationship between MBTI Type and Degree selection, the anticipated differences between teachers (B.Art Education) and artists (B.Fine Arts) were less than expected, a result possibly of an ‘excessively’ homogeneous population as evidenced by the disproportionate numbers of Intuitives in all courses. This homogeneity, due to a common commitment to art suggests that students chose a particular degree such as the B.Art Education with less concern for the ‘teaching’ aspects and more for the commitment to ‘art’. This has implications for later student satisfaction and career commitment.

There are relationships between type and learning approach, learning approaches and anxiety, and between anxiety and career indecision. But they are not necessarily causal relationships. It would appear that it is not simply as Silver, Hanson and Strong (1984) state that Type determines learning style. Nor is it, as Biggs (1987) suggests, a question of the combination of motives and strategies. The real issue is how motivation and strategies are affected by initial choice of Degree, the extent to which this choice is determined by a ‘self-selection’ process according to MBTI Type and the degree to which anxiety is likely given that the course demands do not match expectations and type.

From the data, it seems that there are less Sensates in the B.Art Education than would be expected. However, these students show less anxiety than Sensates in the B.Fine Arts. Similarly the Intuitive student in the B.Fine Arts shows less anxiety than either the B.Design or the B.Art Education indicating the role of a ‘matched’ Type and appropriate degree.

In this study Sensates are more likely to use Surface learning approaches and those using Surface approaches are more likely to be undecided in their careers. As well those using a Surface Approach in studio subjects are significantly more likely to feel anxiety, indicating the importance of matching suitable learning approaches to particular degrees.

Those undecided in their careers are more likely to be anxious. This is not to say that there is any linear causal relationship between these variables.

The following Figure 2 suggests a summary of the possible model of influence regarding the various factors analysed in this study.
Figure 2: A Possible Model of Influence

This model suggests four possible paths of influence. The first suggests that a person of a particular type who has chosen a degree appropriate to that type and who uses an appropriate learning approach will experience low anxiety and high career certainty. The second path suggests the same type student who has chosen a degree that is inappropriate to their type will experience high anxiety and low career certainty. The third path follows a student who chooses a degree that is inappropriate to their type but who uses a learning approach that is appropriate to their type rather than to the chosen degree. This causes high anxiety and low career certainty. The fourth path suggests that a student who chooses a degree that is inappropriate to their type and who follows a learning approach that is inappropriate to their type, may experience low or high anxiety dependent on the low or high career commitment. This path is of little relevance in this study.

Therefore following Path 1 an Intuitive Dominant (or Searching learner) would be most suited to the B.Fine Arts, and if using a Deep Learning Approach will experience lower anxiety and higher career certainty. A Sensing Dominant (or Mastery Learner) will be more suited to the B. Art Education or the B.Design and if using an Achieving approach will also experience low anxiety and high career certainty.

Following Path 2, the Intuitive Dominant student who chooses the most suitable degree, the B.Fine Arts, but who uses a Surface Approach, will experience high anxiety and low career certainty. Similarly the Sensing Dominant student in appropriate degrees such as Education
or Design, but who employs a Deep Approach, will experience high anxiety and low career certainty because the approach is less suitable, thus causing a degree of uncertainty.

However, the Intuitive Dominant student who chooses a less appropriate degree such as Education, and who uses a Deep Approach may still feel high anxiety as there will be a mismatch between initial expectations concerning the degree and the actual requirements of that degree.

Similarly the Sensing Dominant student in the less appropriate B.Fine Arts, using an Achieving approach, may feel anxiety and low career certainty because again there is a ‘mismatch’ between personal study inclinations and the reality of a course that demands a great deal of flexibility and personal initiative. These students are represented in Path 3.

Finally, the student following Path 4 will include the Intuitive Dominant in the B.Art Education and B.Design who uses a Surface Approach and the Sensing Dominant student in the B.Fine Arts who uses a Deep Approach. In these cases the match between the learning approach and the particular degree might compensate for the basic mismatch with MBTI Type. These students may experience low or high anxiety and low or high career certainty dependent on the degree of match between expectations concerning the course and their motivations.

What must be analysed now, is the specific nature, direction and the intensity of the interrelationships between type, learning approaches and other variables such as the appropriateness of the chosen degree when coupled with appropriate or mismatched courses and learning styles. As well, what must be considered, is the potential effectiveness of programmes that prepare students who may be mismatched according to their MBTI type with the degree being undertaken so that their expectations, their natural methods of operating in their environments and their approaches to learning in the very different areas of theory and studio work can be brought together to minimize anxiety and increase both learning effectiveness and career certainty. Whilst intuitively appealing, the proposed model must now be tested.
REFERENCES


Lawrence, G (1989). *People Types & Tiger Stripes*, Florida, Centre for Applications of Psychological Type, Inc.


