

ANALYSIS OF GENDER DIFFERENCES IN ART EDUCATION: RATES OF
PARTICIPATION AND ACADEMIC ACHIEVEMENT IN INTERNATIONAL
BACCALAUREATE ART AND DESIGN EDUCATION.

by

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Abstract

The purpose of this study was to determine if gender differences existed in rates of participation and academic achievement in art education.

Parametric and non-parametric statistical analyses were conducted on data representing the final art grades of 2,231 students from 59 countries, assessed by the International Baccalaureate Organization during the 1995/96 school year.

Statistically significant results indicated that rates of academic achievement, rates of participation, and choices of syllabus were gender-oriented in this population. Boys, in comparison with girls, were found to be less likely to undertake art, to choose less academically oriented syllabuses and to be out-performed academically in art.

It was concluded that boys displayed a lassitude towards art education that was consistent with a more generalized educational trend, currently the focus of neo-masculinist discussion.

Implications of the findings of this study were discussed in reference to boys' level of visual literacy, the relevancy of art curriculum to boys' specific

educational needs, the extent of a "feminine" stereotype of art, and factors within art education which impact on how boys determine "masculinity".

Implementation of "relational" research was urged to investigate the impact of art education on boys' formation of concepts of masculinity, and the potential role of art education in neo-masculinist discussion currently exploring theories of multiple masculinities.

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Chapter I. Statement of the Problem

1.1 Introduction.

A decade ago on a warm spring afternoon in a southern Australian school, I sat in a staff meeting listening with interest to a discussion concerning the students being awarded the annual academic prizes. Coming at the end of my first year of teaching, it was a new experience for me, but a colleague sitting beside me whispered that a similar conversation occurred each year. The names being reviewed were not the concern; each was worthy of the honour. Rather, it was the fact that they were virtually all girls - again. "Where are the boys?" the bewildered Principal asked.

More than ten years later, Pat Clarke, an official in the British Columbia Teachers Federation, asked exactly the same question. "Where are the boys?" (Clarke, 1997). While reviewing that province's high school academic awards he noticed that boys were conspicuously absent. In discussing this phenomena, he lamented a seeming lack of purpose displayed by boys and posited that, in trying to be "manly", boys were surrendering to a nihilistic male sub-culture characterized by poor academic achievement and avoidance of social or educational challenge.

My experiences as an art educator inclined me to agree with Clarke. Since that staff meeting early in my teaching career, I became conscious of consistent gender differences in my art classes; boys seemed less likely than girls to choose art and when they did, were not as academically successful. Over the years my observation of boys' avoidance and poor academic performance in art was so consistent it was seen by me to constitute a worrying trend. But was this trend a generalized phenomena? If it was, did it constitute an educational concern?

1.2 Rationale for the Study

Unfortunately, the queries raised above could not be answered from current literature. Very little has been written about boys' participation and achievement in art education, principally because gender discussion in this field had traditionally followed limited topics of conversation within which boys' issues rarely featured (Packard and Zimmerman, 1977; Pariser and Zimmerman, 1990). This has been, however, characteristic of education as a whole. Since the early 1970s it had been convincingly argued that curriculum was boy-oriented; the construction of curriculum, the focus of texts, pedagogical strategies and academic streaming have been centered on masculinist

meritocracy (Askew and Ross, 1988). Consequently it was research on girls and their problems that warranted particular attention. Until recently no rationale had been established that justified discussion specific to males. As a result very little is now known about boys' experiences generally in education (Bushweller, 1995).

Why Should We Look at Boys' Schooling?

Within the last few years a re-examination of conventional parameters of gender discussion has occurred, prompted by evidence of increased social, gender-interaction and schooling problems of boys.

Some worrying social trends have emerged. Boys have been shown to be four times as likely as girls to commit suicide, be murdered by high school age and twice as likely to be victims of assault or robbery (Bushweller, 1995). They now form the majority (up to 75%) of behavioural and emotional disorder diagnoses (Soderman and Phillips, 1986), the majority of truancies, sexual misconduct and assaults (Jackson and Salisbury, 1996).

Boys' impact on the schooling of girls has increasingly become an issue. Inappropriate behaviour by some boys in class is observed to demand disproportionate amounts of teachers time and limit girls' academic achievement (Sadker and Sadker, 1994). In addition, some

boys' sexist attitudes are considered to affect girls' levels of self-esteem and limit their personal and social potential (Gray, 1987).

Perhaps the most significant - and recent - trend has been the identification of some worrying academic problems for boys. They now form the majority (up to 75%) of special education enrollments in both the U.S.A. (Bushweller, 1996) and the United Kingdom (Soderman and Phillips, 1986). They are disproportionately represented in retention rates between classes (Lee and Bryck, 1986) and have lower academic success and lower expectations than girls of future career prospects (Pascal and Bertram, 1995). Clarke (1997) notes that in a number of school districts in the Canadian province of British Columbia, boys in the 1995/96 school year were 5 times as likely as girls to drop out of school; they achieved 80% of the failing grades, 80% of the suspensions, only 20% of academic honour awards and one third of district and provincial scholarships. Clarke (1997) and Duffy (1996) also note the decrease in male enrollments in undergraduate courses from 60% in the 1970s to 40% in the 1990s.

Facts such as these highlight a perceived crisis with boys. Boys appear to be giving up on their schooling, rapidly becoming what Clarke (1997) refers to as a new

"social underclass", or what the Economist magazine (Men, tomorrow's second sex, 1997) terms the "newest at-risk section of our community."

These concerns have resulted in the emergence of a rationale that argues boys problems are becoming so critical, the paucity of research that exists must be immediately addressed. Subsequently, an increasing body of writing has concentrated largely on subject-specific research. Academic subjects such as English (Martino, 1995; Nilan, 1995; Jackson and Salisbury, 1995; Gilbert and Gilbert, 1995) and Social Science (Smith, 1995) have begun to correlate boys' social, gender-interaction and schooling problems with perceptions of what boys consider "manly" behaviour.

Art education has been largely under-represented in this discussion and will continue to be limited in its ability to offer subject-specific dialogue on this issue until it can establish a construct describing the nature of boys' participation in the visual arts. The questions posed in the introduction, therefore, are timely and relevant. The observed phenomena will be of educational concern as they will indicate the degree to which boys' lassitude towards education, as outlined in recent gender discussion, applies to art. This will be achieved through

documentation of trends within a large international population of boys' participation levels, academic achievement and syllabus selections.

This study will provide foundation data which further studies might utilize to build a discussion concerning the interplay of boys, art and masculinity.

1.3 Research Questions

The research question for this study asked: In the International Baccalaureate population, are boys' levels of participation and academic achievement, and their choice of syllabuses, significantly different to girls'?

In addressing this query, specific statistical tests were used to explore the effects of the dependent variables of grade¹ and participation on the independent variables of gender and syllabus level.

Two question clusters were utilised. The first cluster aimed at determining if gender differences existed in participation in art, and if those rates of participation were consistent between all International Baccalaureate Diploma (hereafter I.B.D.) art/design syllabus levels. The second cluster focused on achieved

¹ Within this context, "grade" refers to the academic mark assigned to students work utilising normal assessment procedures.

grade, attempting to determine if gender differences existed in academic results in I.B.D. art, and whether those academic results were consistent in all syllabus levels.

Question cluster 1.

In the I.B.D., is boys' participation in art significantly different to that of girls'? Are these findings consistent across syllabus levels?

1.1 Does significant difference exist in boys' overall participation in the I.B.O. program compared to girls' overall participation in the I.B.O. program?

1.2 What is the participation rate of students undertaking I.B.O. art compared to overall student participation in the I.B.O. program?

1.3 What is the proportion of boys within the I.B.O. program who study art, compared to the proportion of girls within the I.B.O. program who study art?

1.4 Is the rate of participation in art of boys significantly different than for girls?

1.5 Is the rate of participation in art for all students (boys and girls) significantly different between the three syllabuses utilised in the International Baccalaureate Art/Design program (610, 611 or 612)?

1.6 Is the rate of participation in art in any of the three (610, 611 or 612) syllabuses significantly different for boys than for girls?

Question cluster 2.

In the International Baccalaureate, is boys' academic achievement in art significantly different to that of girls? Are these findings consistent across the 610, 611 or 612 syllabus levels?

2.1 Is achievement in art, as measured by standard grading practices, significantly lower for boys than for girls?

2.2 Is achievement, as measured by standard grading practices for all students (boys and girls) significantly different between any of the three syllabuses?

2.3 Is achievement in art in any of the three syllabuses, as measured by standard grading practices, significantly different for boys than for girls?

Chapter II. Literature Review.

2.1 Historical Background.

Traditional Histories of Gender in Education

Traditionally, histories of gender debate in education have concentrated on the three decades of transformative socio-political changes witnessed during the 1970s, 1980s and 1990s in many Western societies (Askew and Ross, 1988; Gray, 1987). During this time a gender-oriented power imbalance in schools has been identified and continues to be addressed. Of concern has been an inequality of educational opportunity, an inequality of employment opportunity, sexist orientations of teachers curriculum and texts, and sex-role stereotyping; all to the disadvantage of girls.

Subsequent research focused on the following key themes of discussion; the advantages of co-education to provide more equitable educational and career opportunities (Dale, 1969, 1971, 1974; Austin, 1977a, 1977b), strategies to encourage girls' participation in traditionally male-oriented academic subjects (Byrne, 1978), the empowerment of girls to lead (Graham, 1974), to aspire to professional careers (Tidball and Kistiakowsky, 1976) and the negating of sex-role stereotyping through identification and

modification of sexist texts and teaching practices (Taylor, 1981). As a result girls' subject choices were extensively examined and boys domination of the classroom and schooling environment was effectively challenged (Weiner, 1985).

Feminism and Gender in Education

The source of the gender-equity related strategies which culminated from these research agendas have been widely attributed to radical feminist ideology of the early 1970s (Gray, 1987; Soerensen, 1992; Smith, 1995). Women were committed to addressing poor academic achievement by girls, restrictive role stereotypes, lower career expectations, female submissiveness and a lack of assertive skills by girls in the classroom. By the 1980s significant legislation in many countries had resulted in the focus of gender work in education concentrating on the empowerment of girls through an "equal opportunities" approach (Jackson and Salisbury, 1996).

The rewards for girls from these efforts have been so significant that Anne Soerensen, a feminist academic, wrote in 1992 "...we are now witnessing a breakdown of the former educational pyramid. Women as a whole, but especially the young generation, have achieved a more equal position and

they have moved into many former male dominated subjects and areas." (p.201).

Such has been the domination of the debate and the advances made by feminists, the term 'gender issues' in education is now often seen as synonymous with women's issues (Sacca, 1989).

The Emergence of Neo-Masculinism².

Some contemporary interpretations of the history of gender work in education now recognize that, with the predominance of feminist ideology, an educational paradigm too specific to allow gender work with boys was created (Connell, 1989; Martino, 1995; Jackson and Salisbury, 1996). While acknowledging a considerable debt to feminist struggles since the 1970s, neo-masculinist authors describe the historical domination of the feminist perspective in gender discussion as debilitating for the development of a dialogue concerning male identity (Smith, 1995). It has not allowed room for men to discuss issues related to boys (Jackson and Salisbury, 1996). The resulting discussion, emerging only in the last few years, has been to examine the interplay of feminism and the emerging neo-masculinity

² The term "neo-masculinism" and "neo-masculinity" have not received wide usage in gender literature but are considered useful within this discussion as representing those writers whose philosophy endorses a re-interpretation of masculinity from the traditional "unitary" to a more pluralist "multiple" definition.

movement in terms of a re-interpretation of definitions of masculinity. Martino (1995) recognized how, historically, feminist domination of discussion in gender led to the utilization of a "unitary" definition of masculinity which stereotyped males as patriarchal and hegemonic. Jackson and Salisbury (1996) observed a similar historical trend, and questioned how boys could be encouraged to take responsibility for their own change when this definition allowed them such little room to move, and awarded such little credit for efforts boys make to question perceptions of masculinity. Connell (1989) examined the debilitating effect of feminist ideology on boys' classroom discussion of gender issues, resulting in a subsequent suppression of a male-led mandate to effect masculine change.

3.2 Schooling and Gender

The neo-masculinist perspective has gained an element of acknowledgment within gender debate. Although some feminist authors, such as Pallotta-Chiarolli (1990), Burgess (1990) and Bailey (1996) appeared reticent to abandon ideologies that had gained so many advantages with such hard work, more generalist feminist opinions coincided with neo-masculinist theories to create a post-modern paradigm within gender debate in education (Soerensen,

1992). This perspective questioned, after years of fruitful service, the continued appropriateness of "equality of opportunity" measures. Anne Soerensen (1992) argued a re-examination of the historical development of gender work in schools would only further feminist interests and facilitate future development in that same direction. She posited that, in retrospect, radical and liberal feminism appeared to have developed ideologies that were not pluralist. In contrast

post-feminism is, from a theoretical viewpoint challenging the former concepts, maintaining that we have to leave the essential thinking and absolute strategies of the 1970s in order to open up a field of research to plurality and a constructive uncertainty.

(p. 201)

Soerensen (1992), Reay (1990b), Kruse (1992) and others have re-focused, to some extent, feminist debate on boys. Central to post-feminist philosophy is a recognition of the need to include a greater understanding of what makes boys behave as they do (Reay, 1990b). These researchers recognize boys schooling as a previously ignored variable in gender equity debate; "...with the advent of neo-masculinism feminist perspectives have been forced to

reconsider their most fundamental question: Who are the losers and who are the winners?" (Soerensen, 1992; p, 209).

However traditional themes in gender discussion still constitute a majority of writing. Single-gender schooling and segregated classes have enjoyed a renaissance as a arena to discuss girls' improved academic performance (Jiminez and Lockheed, 1989), a venue for interventionist pedagogical strategies with boys (Gray, 1987; Kruse, 1992; Reay, 1990b), and a site for anti-sexist, anti-gender stereotyping pedagogies (Riordan, 1990; Burgess, 1990).

Within art education, the most recent gender publication in North America - Gender issues in art education: Content, contexts and strategies (Collins & Sandell, 1996) - continues to focus on concerns with girls' schooling in art education; topics such as "Art Criticism from a Feminist Point of View" (Congdon, 1996), "Teaching Feminist Art and Social Activism" (Wryick, 1996) and "Feminist Interventions in Teaching Art History" (Attenborough, 1996) point to where the emphasis lies in art education. While the editors of this work claim a wider sphere of contexts are now being represented within gender discussion in art education, these contexts remain limited to "...the recent and dramatic evolution of

concerns related to women, art and education." (Collins and Sandell, 1996; p.xi).

This exclusion of masculine issues within art education is inconsistent with generalised trends in education. Gender research is now being seen as emerging from two decades dominated by feminist oriented "equality of opportunity" discussion, into a phase of discussion more representative of contemporary theories of pluralism (Soerensen, 1992). A pluralist paradigm has been created within the topic of schooling and gender discussion, part of which acknowledges the unique problems boys face in today's educational environment, and the relational aspects of those problems to girls' needs.

2.3 Boys and Schooling

Within this new construct of gender discussion in education, studies such as this one obtain their validity. Establishing a sense of boys academic participation and achievement is a necessary precursor for further investigation of the complex causes of boys' actions in schools (Martino, 1993). This study will, through the vehicle of boys' levels of literacy in art education, point to directions the field ought to take if pluralism is to be achieved. Without this knowledge art education, with its

limited history of research specific to boys, is handicapped in its ability to participate in current discussion concerning boys and schooling.

The nature of this discussion identifies the complex socio-cultural influences on boys' perceptions of masculinity as implicit to their levels of literacy. Alloway, Davies, Gilbert and Gilbert (1996) summarised the consensus of opinions of many authors when they stated "...we can't understand boys' literacy problems unless we understand boys' developing sense of masculinity and how literacy fits within this." (p. 6). The parameters for contemporary discussion concerning boys and their schooling are established within the concept that boys' academic performance is primarily influenced by social, rather than psycho-biological, effects. Contemporary research in this field is beginning to concentrate primarily on the interplay of boys' perceptions of gender and academic worth. Connell (1989) presented the theory of "multiple masculinities". Noting that in the 1980s a variety of types of masculinity existed - "cool guys", "swots" or "wimps" - into which boys were streamed according to pre-existing mores constructed by the school, society and youth sub-cultures. Often this streaming was fought by the youths but such was the influence of peer pressure and the

social constructs of school and home, their efforts were seen to be in vain (Jackson & Salisbury, 1996; Smith, 1995). Connell's analysis of boys struggling within limiting interpretations of masculinity has become the pivotal theme of neo-masculinist discussion. Martino (1994, 1995) and Nilan (1995) utilize de-construction/re-constructionist pedagogies to investigate limiting gender stereotypes within English education and offer similar analyses in relation to instruction in Social Science (Smith, 1995). Mac an Ghaill (1994) also used the theory of multiple masculinities to explore their potential to negate boys' marginalization of sexual (homosexual) ethnic and disadvantaged masculinities.

2.3 Boys' Participation and Academic Achievement in Art Education.

Literature concerning boys' participation and achievement in art is very limited. Art education's traditionally narrow perspective when researching gender-related topics (Helgadottir, 1991) has resulted in data on this topic being limited to appendant information in larger, more generalized studies. Unfortunately, the majority of these have concentrated on limited subject areas - usually mathematics, English, and science (MacCann,

1995) - with little if any information being gathered and discussed relevant to art. Standardized tests, available through national statistical archives, have been shown to be inconsistent in their results; girls perform poorly compared to boys on standardized tests while outperforming them in the classroom (Sadker, Sadker and Steindam, 1989).

MacCann (1995) conducted a comprehensive analysis of examination and assessment results of the New South Wales (Australia) Higher Schools Certificate. A section, specific to art, with a sample of $n = 8,478$ found a disproportionate representation of girls in art (68%). Academically, girls outperformed boys in all areas of the art assessment, with the exception of the 90th and 95th percentiles in the examination section where boys marginally outperformed girls. Overall, boys showed a wider standard deviation; significantly so in the lower end of the distributions.

Gender differences in participation in art education were included as inconclusive appendant information in studies concerning subject preferences in co-educational and single-gender schools by Omerod (1975), Lee and Bryck (1986), Trickett, Castro, Trickett and Schaffner (1982), and Stables (1990). Of interest from these studies was a consistent observation of polarization tendencies of the

subject categories within which art was represented. By polarization, it is meant the tendency for gender differences in subject choice to be accentuated in co-educational schools (Department of Education and Science, 1975). No studies were located that specifically investigated gendered differences in choice of art as a subject of study. This could be seen to form part of the "vacuum of knowledge" noted by Pariser and Zimmerman (1990), who called for "...traditional research to undergird [the] conjectures..." (p.5) evident in art education research in gender issues.

In summary, it is conceded that a study examining participation and achievement in relation to gender will inevitably and unavoidably be challenged to discuss its results in terms of a diversity of socio-political and socio-cultural issues. These issues, such as sexism, gender-stereotyping or equality of opportunity have historically been discussed within education from a predominately feminist perspective. With a growing awareness of the compounding problems of boys in contemporary schooling, the traditional feminist constructs of gender are being viewed - both by some feminists and other academics - as too limiting in their interpretations of masculinity. As a result, post-feminism and neo-

masculinism are advocating a more pluralist approach towards issues of gender. This approach allows studies such as this to work from the rationale that boys may well be disadvantaged by factors within schooling. The identification of these factors, and the development of strategies to address their impact on boys' inappropriate behaviour and sexist gender-concepts will ultimately serve the needs of both boys and girls.

Chapter III. Method.

For the purpose of this study, a large sample was required of male and female students from a population of art students with a homogeneous syllabus and assessment method.

3.1 Data Source.

A primary source of data which fulfilled these criteria was obtained through the International Baccalaureate Organization, Cardiff, Wales (hereafter I.B.O.). The I.B.O. provided scores of 2,231 male and female students from 59 countries (Appendix A) who were examined in their art/design program during the 1995/96 school year. This number represented the full I.B.O. art/design population assessed in the Northern Hemisphere for that year.

The data was obtained through negotiations with the I.B.O. The data was compiled by I.B.O. staff from a list of requirements supplied by the researcher (see Appendix F). It was supplied in computer printout format for transcription to data file and statistical computer analysis by the author.

The I.B.O. Program.

The I.B.O. offers a 2 year program culminating in the award of an I.B. Diploma (I.B.D.). The I.B.D. is a pre-tertiary award, internationally recognized as a university entrance qualification. Strong results in the I.B.D. are seen to ensure entrance to major universities worldwide (Anderson, 1994).

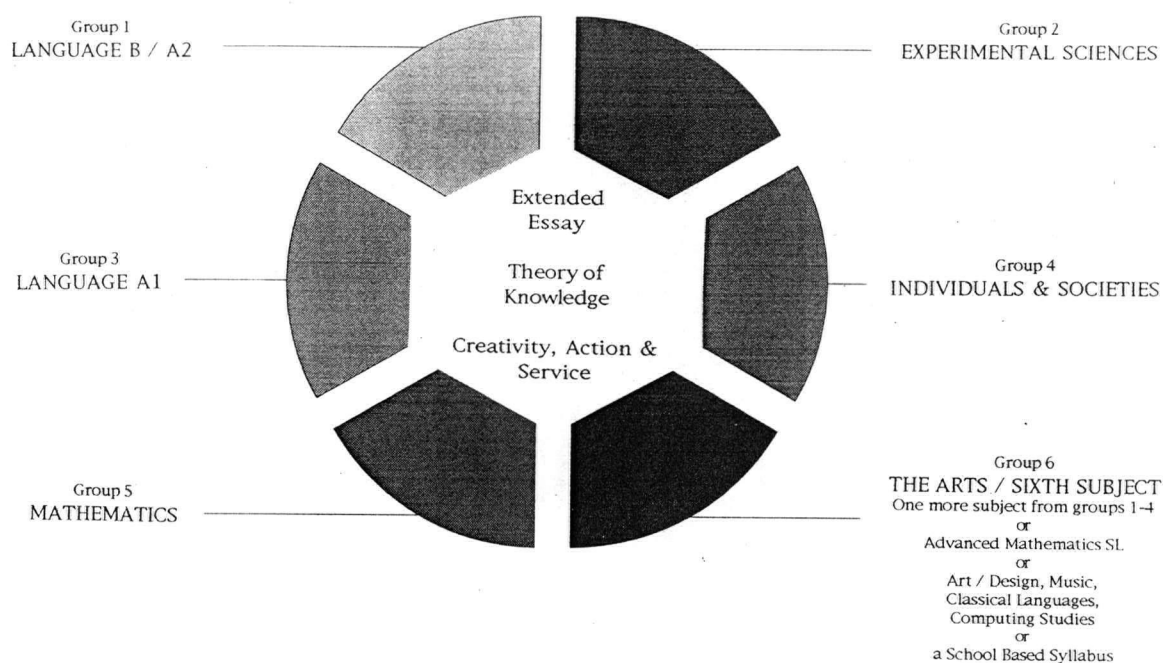


Figure 1. Diagram of the curriculum structure of the International Baccalaureate Diploma.

The program constitutes a comprehensive, multi-disciplinary course of study, operating within a school-based curriculum development model and utilizing moderated, criteria-based assessment procedures.

Students study 6 subjects over a two year period - 3 at the Higher Level, or H.L., and 3 at the Subsidiary Level or S.L. (see Figure 1). The levels of study are differentiated by contact hours - 240 for the H.L., 120 for the S.L. - and also by curriculum content which is seen as encompassing a greater commitment and range of skills development within the H.L.

In addition to studying the six subjects, full diploma students are expected to complete an extended essay, follow a course in the theory of knowledge, and undertake extra-curricular activities. It is also possible for students to study one or two individual I.B.D. subjects, for which they can be awarded individual certificates (Chalmers, 1988).

Art within the I.B.D. Art/Design is included within the sixth group together with 6 other options. The aims of the art/design component of the I.B.D. encompass the development of high quality, personally meaningful, aesthetic, imaginative and creative skills with a pluralist emphasis on the developing of visual literacy skills (Chalmers, 1988).

Its curriculum is offered as three syllabuses; the H.L. with a studio/research curriculum, the S.L. (studio) or the S.L. (research); of which the students choose one. The H.L. syllabus encompasses a combination of studio and research components. Students are required to develop a personal focus to visual art production through the disciplines of criticism, art production and art history (Blaikie, 1994). Appendix B provides an outline of the course and the criteria for the studio and research components.

Assessment procedures for I.B.D. art/design. An externally assessed, portfolio display/interview method of assessment is utilized. An external examiner - usually a practicing art educator - conducts an interview with each student, assessing the work through discussion, review of the research workbook, and examination of the portfolio.

Students may present a research workbook, or a portfolio of studio work for assessment at either of the subsidiary 612 or 611 syllabuses. Appendix C provides the criteria on which assessments are made.

Grades are awarded on a 1 to 5 ordinal scale for each of the 6 criteria with 5 being the highest possible score. Scores are weighted by the I.B.O. (see Appendix C) to give proportional credit to "imaginative and creative thinking"

(studio component) and "independent research" (research component). A final grade award on a 0 (failure) to 7 (excellent) ordinal scale is produced.

3.2 Design of the study;

Because all data was obtained from existing files of past art students within the I.B.O. program, a non-experimental, ex post facto design was utilized. The intention was to address the research questions utilizing both descriptive and inferential statistics.

Initially, the subjects represented by the data were treated as a population on the basis that they represented the entire collection of events in which we were interested (Howell, 1997, p2). This allowed a descriptive analysis of data to answer some research questions using distribution tables, means and standard deviations.

Secondly, gender differences in rates of participation and academic achievement scores were tested for significance utilizing the inferential statistic models of chi-square (χ^2) and factorial analysis of variance (ANOVA). Differing inferential statistic models were considered necessary for analysis of significance of data on participation and achievement.

Choice of Statistical Models

Participation. The data concerning participation rates was presented as the frequency of participation occurring within the categories of gender (boys and girls) and syllabus (610, 611, 612). The appropriate non-parametric statistical test for these conditions was considered to be an independent-samples chi-square test (Howell, 1997). This test allowed questions to be answered that concerned associations or relationships of 2 or more populations based on frequencies of observations in categories (Schumacher and McMillan, 1993). When analysis of participation data concerning one independent variable was required, the appropriate statistic was considered to be the goodness-of-fit chi-square test.

Achievement. The data on achievement grades was presented as the means of factors with two or more levels. Traditionally, comparison of means has been undertaken utilizing a variety of parametric statistical tests. Of those relevant to the types of variables being analyzed, the use of multiple independent sample *t* tests, or multiple one-way ANOVAs were considered inappropriate due to the

higher probability of familywise error³ ($\alpha_{FW} = .15$),
(Appendix D).

Factorial analysis, on the other hand, allowed for analysis of more than two independent variables, each with more than two levels with no danger of familywise error. The 2-way ANOVA required for this study enabled all three questions to be answered in one test; two concerning main effects, and one concerning interactions.

Statistical Designs

Design of the chi-square. An independent-samples, 2 x 3 (gender x syllabus) chi-square design was utilized for tests conducted with 2 factors with more than two levels. The dependent variable was frequency of enrollment. The independent variables were gender - with it's two levels, boys and girls - and syllabus, which contained three levels - 610 = high; 611 = subsidiary syllabus, studio based; and 612 = subsidiary syllabus, research based.

Goodness-of-fit chi-square tests were conducted for analyses concerning only one factor.

Assumptions. Each observation (subject) was represented in only one category, independent sampling was assured, and sample sizes were well above the minimum

³ "Familywise error" describes the tendency for incorrect findings to be compacted by repeated testing.

required of ≥ 5 (Glenburg, 1987). The assumptions were considered to be met.

Design of the ANOVA. A 2 x 3 (gender x syllabus) factorial analysis of variance (ANOVA), randomized groups design, was utilized. The dependent variable was grade represented on a 0 (fail) to 7 (high) ordinal scale. The independent variables were gender, with two levels (male and female) and syllabus with three levels (610 = high; 611 = subsidiary syllabus, studio based; and 612 = subsidiary syllabus, research based).

Tukey's Honestly Significant Different post-hoc comparisons (hereafter Tukey's HSD) were implemented on the independent variable of syllabus level to identify syllabus effect.

Assumptions. Statistical conventions have traditionally required the meeting of data, sample and population assumptions before ANOVA results can be considered valid (Cone and Foster, 1996).

Data assumptions required the use of interval or ratio scales of measurement. The data for this study was not interval or ratio; rather, it was presented on an eight point ordinal scale. However, recent literature has convincingly argued the robustness of ANOVA when utilizing ordinal data (Howell, 1997; Boneau, 1960 cited in Howell,

1997; Box, 1953, 1954a, 1954b cited in Howell, 1997; Bradley, 1964 cited in Howell, 1997). This assumption was considered met.

Sampling assumptions required the use of independent sampling. Independent sampling requires that each subject be represented only once within the data. This assumption was considered met.

Population assumptions required normal distributions and comparable variances (Glenburg, 1986). Both distributions were reasonably symmetrical in distribution and variances reasonably homogeneous. Furthermore these requirements have been somewhat nullified by recent literature which has convincingly argued ANOVA's robustness to non-conformity and non-normality (Boneau, 1960; cited in Howell, 1997). These assumptions were considered to be met.

3.3 Procedure.

Variables Within the Obtained Data Set.

The I.B.O. supplied, for each student, data concerning gender, final academic grade in art, syllabus level in which the art score was obtained - given as both a category and syllabus number - the participant's school code number, the schooling type (single-gender or co-educational), the

total students (by gender) in each school enrolled in the I.B.O. program and the country in which the school was situated.

Variables chosen. The independent variables chosen from this list for this study were gender, syllabus level, and total of students (by gender) studying in the I.B.O. program. These were selected on the grounds that the primary objective of this study was an investigation of boys participation and achievement in art. Supplementary variables were rejected if perceived to confound the statistical viability of this objective.

Variables rejected. Although some interest existed in possible differences in art scores between countries, the variable of country was eventually rejected. This was done because 1) the I.B.O. data contained a large degree of representation of ex-patriate students studying in international schools that could negate the true 'international' classification of this variable; 2) widely disparate sample numbers (see Appendix A) between countries would make statistical conclusions suspect, and 3) a $2 \times 3 \times 59$ (gender x syllabus x country) ANOVA would not be able to successfully compute higher order interactions with the existence of empty cells in some syllabuses from some countries.

The variable of schooling type was of considerable interest; the representation of boys and their achievement in single-gender schools in comparison to co-educational schools was significant in light of current neo-masculinity discussion. However, with only one boys' single-gender school in the data⁴ the validity of any findings was questionable.

The variable representing the three specific syllabuses (610,611,612) was chosen in favour of the variable representing the two categorical levels (High or Subsidiary). The choice of this variable allowed an interpretation of trends in boys' participation in studio-oriented or research-oriented art education curriculum, and boys' academic achievement in those orientations relative to girls. If required, descriptive statistics could still be utilized to examine trends concerning the categorical levels by simply combining the 611 and 612 data.

Treatment of 'N' and 'P' grades.

A number of scores were presented in the data as 'N' (failed to adequately meet criteria) and 'P' (pending; absent from assessment, failed to meet criteria). On

⁴ The I.B.O. data incorrectly classified at least one all-boys school as 'mixed', leading to the conclusion that more errors in the data might exist. A reasonable sample might be possible for future studies.

advice from the I.B.O. these scores were interpreted as a fail, and awarded an '0' rating.

3.4 Analysis of Data.

Data was analyzed using the Statistical Package for the Social Sciences (SPSS).

Alpha Level.

Traditionally, convention in statistics in the Social Sciences has accepted an alpha level of $\alpha = .05$ as an appropriate level of significance (Howell, 1997). It allows a low probability (.05) of Type I errors (α) while retaining a reasonable power ($1-\beta$) to detect Type II errors (β). This alpha level was adopted for this study.

Power Analysis.

With a two-tailed test, an $\alpha = .05$, an effect size (Appendix E) of $d = .40$, and a sample size of $n \approx 750$, Cohen's (1988) Power Table indicated the study demonstrated a power of $>.99$, or a $>99\%$ probability of correctly rejecting a false null hypothesis.

3.5 Limitations of the study

Generalization of the Results;

Results from the descriptive statistical analyses were applicable only to the population of students assessed in

the Northern Hemisphere I.B.O. art program in 1995/96. Inferential statistical analysis of participation (chi-square) and achievement (ANOVA) was generalized only to students in the I.B.O. program in other years including those from the Southern Hemisphere population.

Any statistically significant results could not be assumed to be indicative of the whole art education population; principally because the data collection did not fulfill the required assumptions for randomized sampling to allow generalization. In as much as the purpose of this study was to explore if the phenomena concerning the researcher's classroom observations of boys participation and achievement rates was more generalized, limiting the conclusions to the 2,231 I.B.O. art students more than fulfilled this objective.

However, it should be recognized that the I.B.O. data provided a comprehensive source of art education data. The sample size was very large. Data was obtained from art students in a range of school grades (10, 11 and 12). It represented students from over 200 schools - private and public, co-educational and single-gender, church and non-church. The schools represented a wide range of countries - 59 in all - from each of the five continents. The data was obtained using homogeneous methods; identical

curriculum and assessment criteria were used and moderation procedures were utilized to assure homogeneity in assessment procedures.

As such, findings from the I.B.O. data can be interpreted as representative of a wide, art education population. Results from this study could be viewed as indicative of important trends in art education.

Causation

The statistical analysis from this study was not appropriate to be used to interpret causation of identified trends. It identified a situation; further specific quantitative or qualitative studies are needed to investigate why any trends identified by this study exist.

Chapter IV. Results and Conclusions.

4.1 Participation.

Considerable gender differences concerning student participation were detected in both the overall I.B.O. program and within the art program (Table 1).

Boys and girls were not evenly represented in the overall I.B.O. assessments for the 1995/96 school year; of the 24,252 students assessed, girls constituted 53.45%

Table 1.

Relative Frequency of Girls' and Boys' Participation in I.B.O. and I.B.D. in Art.

Enrollment	Boys		Girls	
	<u>n</u>	%	<u>n</u>	%
I.B.O.	11,289	.4655	12,963	.5345*
Art (I.B.D.)	793	.3554	1,438	.6445**

* $\chi^2 = (1, N = 24,252) = 115.54 \text{ } p < .005$

** $\chi^2 = (1, N = 2,231) = 186.47 \text{ } p < .005$

(12,963) and boys 46.55% (11,289) ($\chi^2 = [1, N = 24,252] = 115.54$ $p < .005$). In answering question 1.1, it was concluded that a significant difference existed in the overall representation of boys in the I.B.O. program, compared to the overall representation of girls.

Question 1.2 and 1.3 asked what proportion of the overall I.B.O. population undertook art and the proportion represented in that figure of girls and boys. It was found that 2,231 or 9.20% chose art as the optional subject within the sixth group. 1,438 (11.09%) of girls chose art, while 793 (7.02%) of boys chose art.

Question 1.4 asked if the differences in enrollments of girls was significantly different to the enrollment of boys. Girls were found to significantly over-represent boys in art ($\chi^2 = [1, N = 2,231] = 186.47$ $p < .005$). They accounted for 1,438 or 64.5% of art enrollments compared to boys' 793 or 35.5% of art enrollments.

Overall participation decreased significantly between the higher and lower syllabuses (see Figure 2). 1,257 students (56.3%) were assessed in the higher 610 syllabus, 778 (34.9%) and 196 (8.8%) were assessed in the lower 611 and 612 syllabuses respectively. In answering question 1.5 - does participation differ within the syllabuses -

significance difference was found ($\chi^2 = [2, N = 2,231] = 759.25$ $p < .005$).

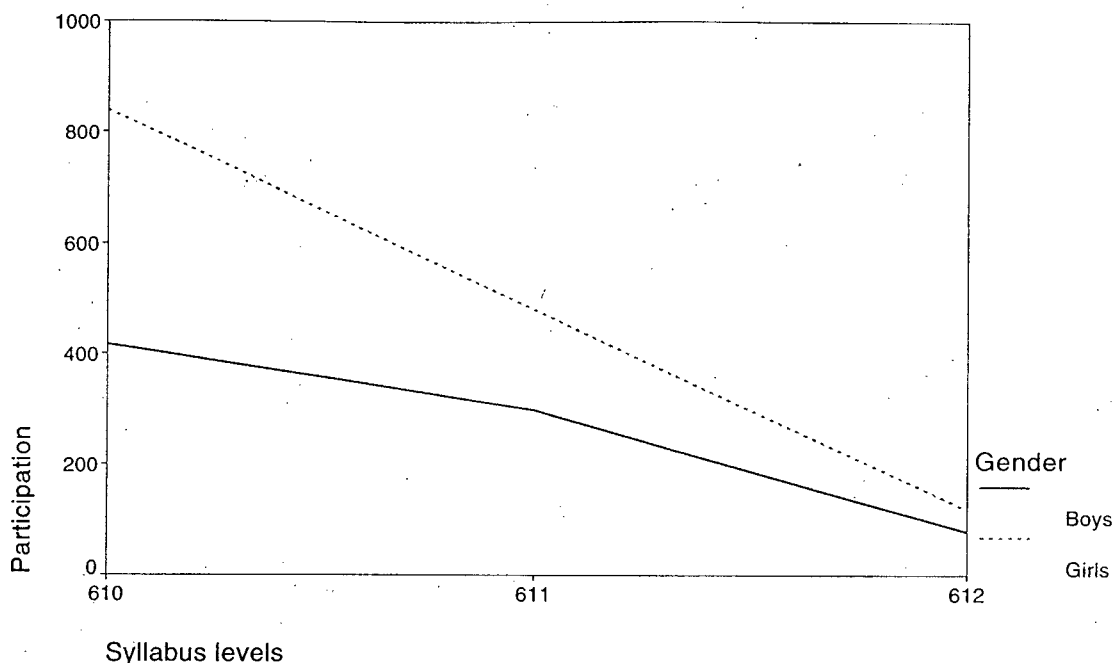


Figure 2. Frequency Polygon of Participation Levels;
Gender x Syllabus.

Question 1.6 asked if significant gender differences occurred in any of the three syllabuses. In addition to an overall (boys and girls combined) decrease in numbers across the three syllabuses, significant gender differences were also detected in participation rates. Figure 2 and Table 2 illustrates the significant drop in participation rates between the syllabuses by both genders (χ^2

[2, \underline{N} =2,231] = 17.38 $p < .005$) and boys significant under-representation in each syllabus (610 syllabus, χ^2 [1, \underline{N} =1,257] = 142.35 $p < .005$; 611 syllabus, χ^2 [1, \underline{N} =778] = 42.58 $p < .005$; 612 syllabus, χ^2 [1, \underline{N} =196] = 8.16 $p < .005$). An interaction between syllabuses was also evident - boys were more likely to study in the 611 and 612 syllabuses.

Table 2.

Frequency of Student Participation in Art, by Gender.

Gender	n	syllabus		
		610*	611**	612***
Male	793	417	298	78
Female	1,438	840	480	118

* $\chi^2 = [1, \underline{N} = 1,257] = 142.35, p < .005$

** $\chi^2 = [1, \underline{N} = 778] = 42.58, p < .005$

*** $\chi^2 = [1, \underline{N} = 196] = 8.16, p < .005$

This can be seen in Table 3, where the relative (%) frequency of boys participation compared to girls was found to be greater in the lower, 611 and 612 syllabuses. In

comparison to girls, boys showed a trend of lower proportional participation in the higher syllabus, a significant trend towards proportionately higher participation in the lower syllabuses, and a tendency to study the studio-oriented rather than research-oriented lower syllabus.

Table 3.

Contingency Table of Relative Frequency of Student Participation in Art, by Gender.

Gender	syllabus		
	610	611	612
Male	.526	.376	.098
Female	.584	.334	.082

Overall, girls clearly over-represented boys in participation rates in this assessment of the I.B.O. art program by nearly 2 to 1. In addition, gendered enrollments differed significantly between syllabuses, leading to the conclusion that not only did fewer boys

study art, their choice (proportionately) of which syllabus to study differed from that of girls.

4.2 Achievement.

Disparate gender differences were also found in achievement levels in art within the I.B.O. program.

Table 4.

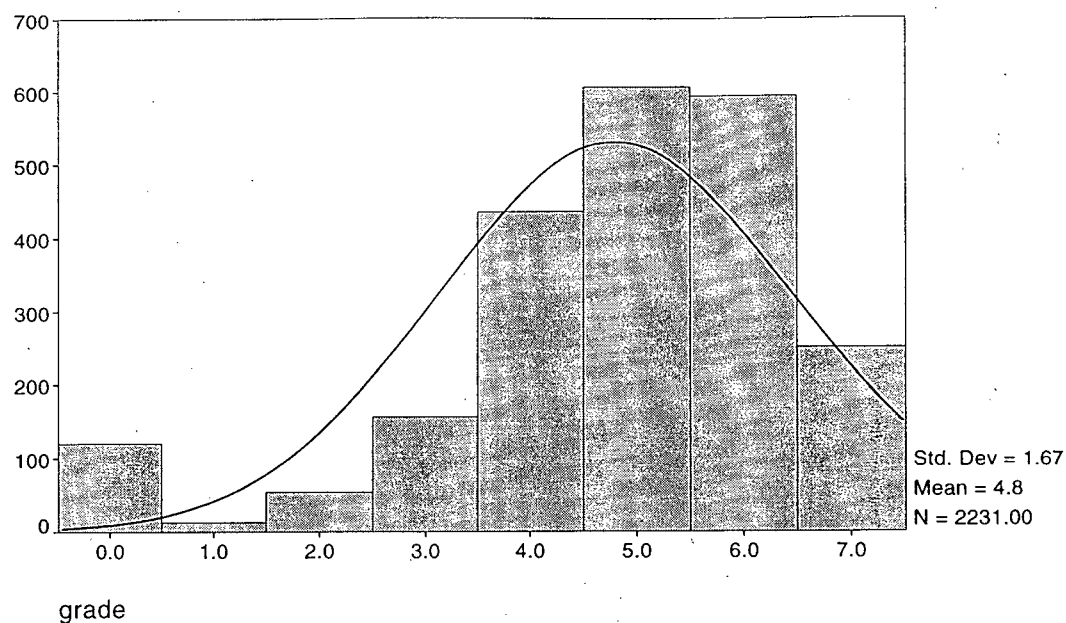
Distribution of Grades, (Gender and Syllabus Combined).

Score	Frequency	%	Cumulative %
0	120	5.4	5.4
1	13	0.6	6.0
2	54	2.4	8.4
3	156	7.0	15.4
4	436	19.5	34.9
5	607	27.2	62.1
6	594	26.6	88.7
7	251	11.3	100.0

When combined, the final grades for all students in all syllabuses ($N = 2,231$) were distributed around a

population mean of $\mu = 4.791$, and a population standard deviation of $\sigma = 1.675$.

A slight bimodal distribution of scores was seen in the distribution of grades (Table 4) with the proportion of students scoring "0" higher than students scoring "1" and "2". This trend was not significant (measure of kurtosis = 1.466). A mean of $\bar{M} = 4.791$, median of 5.00 and mode of 5.00 resulted in a negative skew to the distribution. This



Combined for gender, syllabus. Normal distribution curve superimposed.

Figure 3. Histogram of Distribution of Grades, Gender and Syllabus Combined.

skew was not seen as significant (measure of skewedness = -1.188). The resultant histogram of distribution of grades

(Figure 3) indicated that a normal distribution of grades could be assumed.

Grades were initially analyzed by syllabus, with gender combined, to determine the pattern of distribution in individual courses and to compare scores between syllabuses. The bar chart of the distribution of grades by syllabuses (Figure 4) indicated roughly normal distributions in each of the syllabuses with the trend of a

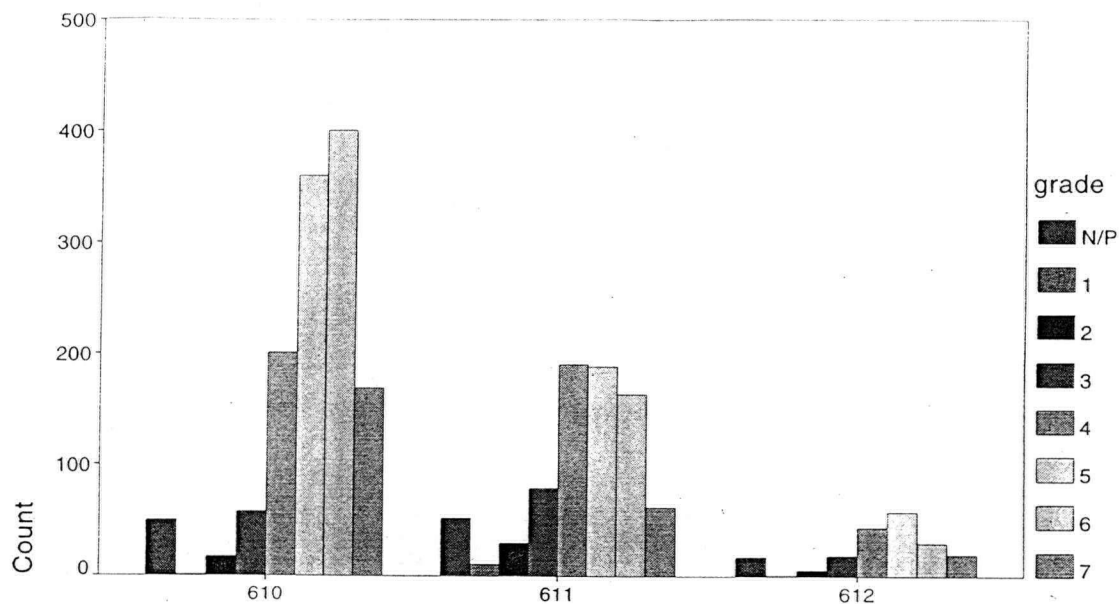


Figure 4. Bar Chart of Distribution of Grades, by Syllabus.

negative skew more pronounced in the 610 syllabus. It also illustrated a trend of consistently decreasing mean scores

from the 610 to the 612 syllabuses, the mean of scores being $\bar{M} = 5.09$, $\bar{M} = 4.42$, $\bar{M} = 4.37$ for the 610, 611 and 612 syllabuses respectively. Variances increased as means decreased between the syllabuses, with standard deviations being found of $\bar{SD} = 1.53$, $\bar{SD} = 1.77$, $\bar{SD} = 1.86$ for the 610, 611 and 612 syllabuses respectively. Gender differences were apparent in overall art scores when examined with the syllabuses combined. Girls, with a mean of $\bar{M} = 4.87$ ($\bar{SD} = 1.64$) out-performed boys in overall art scores. Boys scored an overall mean of $\bar{M} = 4.66$ ($\bar{SD} = 1.73$).

Table 5.

Summary of means. Grades, by Syllabus Level and Gender.

Syllabus	Males		Females	
	<u>n</u>	<u>M</u>	<u>n</u>	<u>M</u>
610	417	4.91	840	5.18
611	298	4.49	480	4.37
612	78	3.94	118	4.65

When examined by syllabus, girls out-performed boys in two of the three syllabuses. Girls showed a higher mean

score than boys in the 610 syllabus and 612 syllabus. Boys showed a higher mean score than girls in the 611 syllabus (see Table 5.). A study of distribution of actual scores values by gender (see Figure 5) indicated a disparity of allocation of grades in this distribution. Boys appeared to be more likely to score lower grades - at the 2/3 level - and girls more likely to score higher grades at the 6/7 level.

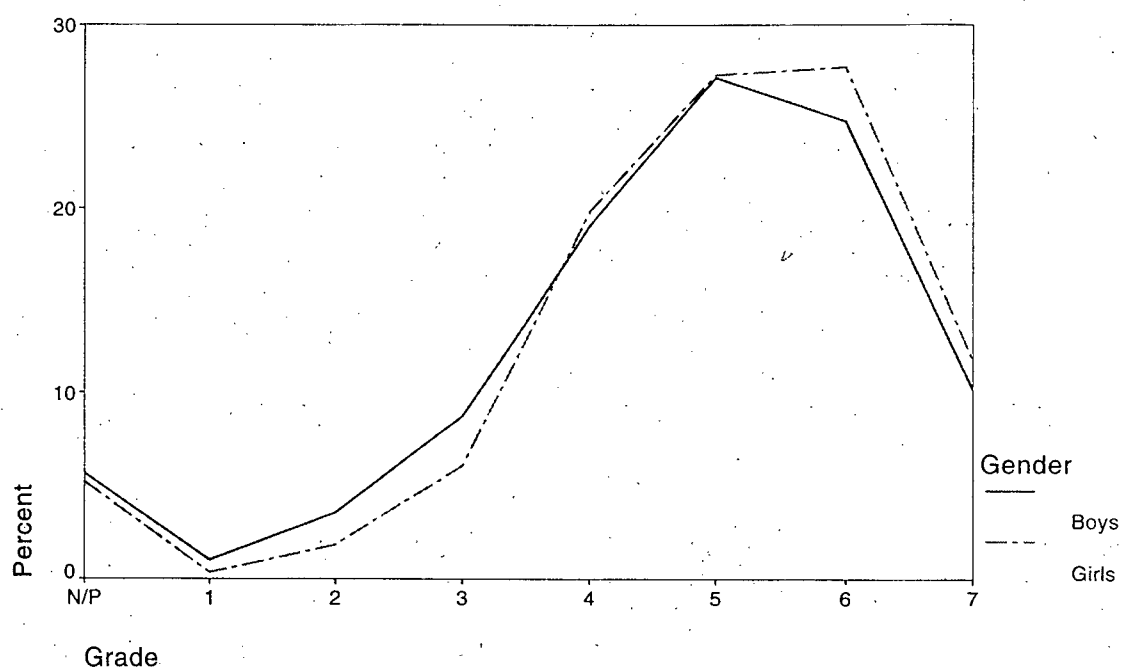


Figure 5. Polygon of Frequency of Award of Each Grade, Value, by Gender.

A summary of this data on achievement by syllabus⁵ and gender is shown in Figure 6. Girls clearly out-performed boys in two of the three syllabuses, and maintained a reasonably high mean score in all three syllabuses. Boys

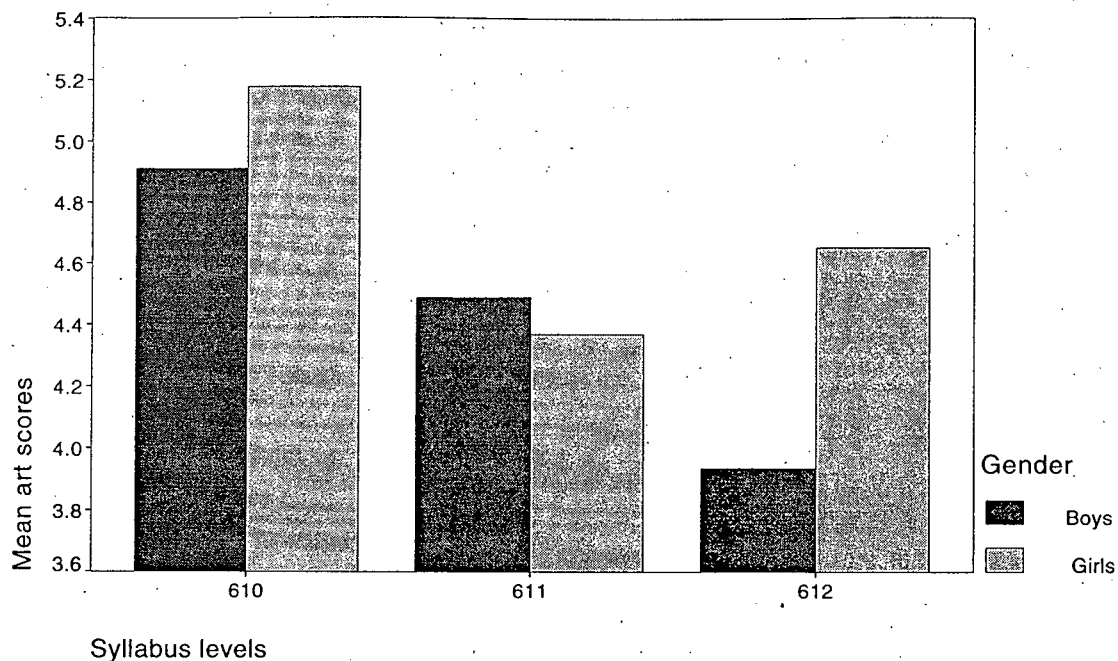


Figure 6. Bar Chart of Boys and Girls Mean Art Scores, by Syllabus

⁵ To reiterate, the syllabuses consist of: 610 = 240 hours of study, with both studio and research components; 611 = 120 hours of study, studio component only; 612 = 120 hours of study, research component only.

achieved a higher mean than girls in only the 611 syllabus, and displayed a lower mean score in the 610 syllabus and, in particular, the 612 syllabus.

A 2 x 3 (gender x syllabus) factorial analysis of variance (ANOVA), randomized groups design, was conducted to investigate if these gender differences were significant. The test was conducted using an alpha level of $\alpha = .05$. A Tukey HSD post-hoc procedure was performed against significant results on the variable of syllabus.

Table 6.

Summary Table for the 2 x 3 (Gender x Syllabus) Randomized Groups ANOVA

Source	<u>S.S.</u>	<u>d.f.</u>	<u>M.S.E.</u>	<u>F</u>
Gender (G)	24.548	1	24.548	9.179*
Syllabus (S)	211.563	2	105.781	39.553**
G x S	32.258	2	16.129	6.031*
Error	5950.566	2225	2.674	

* $p = <.002$, ** $p = <.001$

Results from the analysis (Table 6) indicated that statistically significant gender differences in academic performance in art within the I.B.O. program existed.

A significant main effect for gender was found. The mean of all art scores of boys ($\bar{M} = 4.66$) differed significantly from the mean of all art scores of girls ($\bar{M} = 4.87$), ($F [1, 2225] = 9.179, p < .002$). In answering question 2.1 - Is academic achievement in art significantly lower for boys than for girls? - it was concluded that boys achieved significantly lower overall art scores than girls.

A significant main effect for syllabus level was found. Means for the three syllabuses (610 syllabus $\bar{M} = 5.09$; 611 syllabus $\bar{M} = 4.42$; 612 syllabus $\bar{M} = 4.37$) differed significantly ($F [2, 2225] = 39.553, p < .001$).

Post-hoc comparisons using the Tukey HSD procedure revealed significant differences for students' grades achieved for the 610 syllabus compared to the 611 and 612 syllabuses. Students in the 610 syllabus achieved significantly higher grades than students in the 611 and 612 syllabuses. Grades in the 611 and 612 syllabuses did not differ significantly. In answering question 2.2 - Is achievement for all students significantly different between the syllabuses? - it was concluded that students in

the higher syllabus scored significantly higher grades than students in the lower 2 syllabuses.

A significant 2-Way interaction was found (see Figure 7) between gender and syllabus, ($F[2,2225]=6.031$, $p < .002$) This indicated that, statistically, the differences between boys' scores in some or all of the three syllabuses and girls' scores in some or all of the syllabuses were large

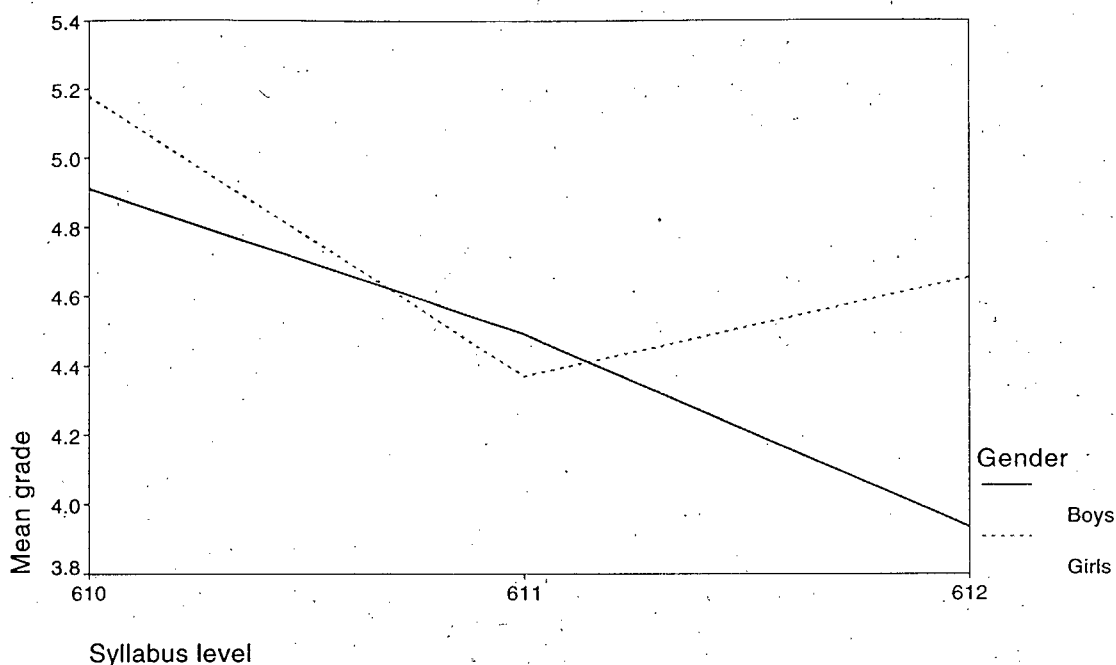


Figure 7. Plot of Significant Interaction Effect. Grades, by Syllabus Level and Gender.

enough to conclude true differences did exist. To determine which boys' scores in which syllabuses were statistically different from girls' scores, a Tukey HSD

post-hoc comparison was run. This test indicated that the means of the 610 ($\underline{M}_{\text{girls}} = 5.18$, $\underline{M}_{\text{boys}} = 4.91$) and 612 ($\underline{M}_{\text{girls}} = 4.65$, $\underline{M}_{\text{boys}} = 3.94$) syllabuses differed significantly for the genders while performance on syllabus 611 ($\underline{M}_{\text{girls}} = 4.37$, $\underline{M}_{\text{boys}} = 4.49$) was not significantly different. In answering question 2.3 - Is achievement in any of the three syllabuses significantly lower for boys than for girls? - it was concluded that boys scored significantly lower than girls in the 610 and 612 syllabuses. Although girls scored slightly lower in the 611 syllabus it was not significant.

The ANOVA analysis indicated that significant gender differences existed in performance in art. Girls performed at a higher level in the academically oriented syllabuses - the higher 610 syllabus and the research-oriented 612 syllabus - while boys performed better than girls in the lower studio-oriented syllabus.

4.3 Summary of Findings

The significant main effects for syllabus and gender, and the significant 2-way interaction for syllabus by gender indicated that the distribution of academic achievement and participation rates was not equitable between boys and girls within the I.B.O. data. A definite, gendered difference existed in favour of girls higher

academic achievement. In addition, significantly greater numbers of girls participated in I.B.D. art/design; these differences existed across the three syllabuses, although proportionately girls were found to be more likely to study the more academically challenging higher syllabus (610) and the research oriented lower syllabus (612).

It was noteworthy that significant chi-square findings on participation rates coincided with significant ANOVA findings concerning achievement rates. The syllabuses favoured by girls (in comparison to boys) in terms of participation were also the syllabuses in which they achieved significantly higher results. Similarly, boys' favoured (in comparison to girls) syllabus was the syllabus in which they out-performed girls.

The choice of syllabuses was also of interest. For girls, the favoured syllabus was the more academically rigorous higher studio syllabus (610). The boys' preferred syllabus (in comparison to girls) was the less demanding studio syllabus (611). The syllabus in which boys were proportionately least inclined to study (612) was also the syllabus in which they performed the worst.

Standard deviations were of interest. Boys showed wider variations in academic scores compared to girls. As the syllabuses became less academically challenging, boys

scores varied further from the mean. In comparison, girls presented a smaller standard deviation than boys in all syllabuses.

The statistical findings from this study supported the trend identified by the researcher through classroom experience; boys (at least within the I.B.O. program) were significantly under-represented in art and achieved significantly lower academic scores than girls. It also supported findings by MacCann (1995) which indicated girls in the New South Wales (Australia) Certificate of Education were twice as likely as boys to study art, they achieved significantly higher grades than boys, and that boys had a wider variance in art scores - a phenomena particularly pronounced in the lower distributions.

This study demonstrated that there is evidence of gender-orientation in participation rates and academic achievement in art education among students participating in the I.B.D. program. Evidence also exists of a "lassitude", or laziness towards academic performance by boys in art/design within the I.B.D. This is indicated by their appearance to avoid academic challenge through the choice of less demanding syllabuses, and a wider variance of scores than girls in all syllabuses. In addition, their academic results indicated either a lower ability in art

compared to girls and/or an unwillingness to be seen as successful in the subject.

Chapter V. Discussion.

5.1 Implications of findings for art education.

This study identified significant gender differences existing within the I.B.O. art program in terms of boys' rates of participation and academic achievement. In discussing the implications to art education of those findings, attention should first be given to three questions. Were the detected differences significant enough to be able to conclude that current I.B.D. art curriculum in some way disadvantages boys? Could it be possible the differences are an isolated aberration? Are the differences simply indicative of "natural" gender preferences in subject selection?

Eisner (1988) stressed the visual arts should play a core role within the wider school curriculum due to its ability to facilitate perception and visual literacy skills. Recognition of the importance of this element within the holistic academic experience of education has slowly and painstakingly been built to the degree that it has achieved status in national standards documents in Britain, the United States, and Australia. The results of this study suggests these benefits, considered important by

art educators, are not being enjoyed equally between boys and girls. Using this rationale art educators must admit that these results from the I.B.O. program indicate boys are exiting compulsory schooling deficient in levels of visual literacy in comparison to girls; an educational disadvantage only compounded by adding similar arguments for creative and technical skills developed through art. Boys are being disadvantaged by being limited in their exposure to the visual arts.

Are the detected differences an aberration? Limited studies suggest they are not. While very little empirical research has examined boys' participation and achievement rates in art education, striking similarities can be seen between the present findings and those from MacCann's (1995) study which also found significantly lower participation by boys in art education, significantly lower overall academic grades and a tendency for boys' scores to display a wider variance in the lower sections of that State's art program. However, further research is required to more widely generalize the detected trends.

Are the findings simply the result of "natural" gender-preference in choice of subject? Some studies indicate differences in boys representation in specific subjects may be the result of socio-cultural, rather than

psycho-biological or innate differences. Omerod (1975), Stables (1990) and Lee and Bryck (1985) note gender-preferences in subject choice are polarized in co-education indicating that under single-gender conditions boys are more likely to study "feminised" subjects such as art. Boys appear to wish to study art, but complex socio-cultural factors within the co-educational schooling environment appear to confound that wish.

The results of the study indicates that the under-representation and academic under-achievement of boys should constitute a significant educational concern. In recognizing these phenomena, the results of this study require subsequent identification of potential causes and suggestions for further research to examine more fully their impact on art education. Current neo-masculinist discussion provides one framework for such a discussion. It posits that boys' under-representation and lack of academic success are the result of at least three factors;

- 1) boys misguided concepts of what constitutes "manly" behaviour,
- 2) restrictive definitions of masculinity by schools and society, and
- 3) a schooling system unresponsive - or not used to - boys' unique needs.

An examination of these factors in reference to art may provide some directions to more fully explain boys' inconsistencies in achievement and participation in art education in comparison to girls.

Art Education and Boys' Concepts of Masculinity.

Thompson (1986) notes boys' academic and behavioural decisions are often strongly influenced by inappropriate concepts of gender. That is, whenever boys make conscious or sub-conscious decisions - whether it be choice of academic subjects or attitudes towards appropriate or inappropriate behaviour - they show a reticence to choose any option with perceived "feminine" traits. Unfortunately her argument leads to a definitional stereotype of boys as inherently hegemonic and homophobic. Her point is worth considering, however. Boys' decisions may be strongly influenced by sexist concepts and art education may be a victim of this phenomena.

Some limited empirical evidence supports this notion. Stables (1990) and Omerod (1975) find significant gender orientations in some academic subjects. They posit many subjects hold gender-oriented popular culture stigmas. Within that construct art is often categorized as belonging to the 'feminine' domain, leading to the assumption that

participation levels are affected because boys may not view art as a 'manly' subject. Interestingly, they isolate gender-specific schooling as a significant variable in this phenomena. Both boys and girls, they say, are more likely to study subjects of the differing gender 'orientation' in single-gender schools; a position supported by Burgess (1990) who states that:

Educated together, girls and boys feel the need to assert their sexual identity, and define themselves by means of behaviour and subject choice; thus subjects acquire a masculine/feminine connotation which in effect, restricts the individual's freedom of choice. (p.92)

The impact of gender-specific schools on art curriculum and consequent participation and achievement levels has received virtually no attention from art research in the past. As a possible avenue to explore the cause of disparate gender differences in art education enrollment, research on single-gender schooling may constitute a rich field for a better understanding of gender differences in the subject. The possibility exists that boys avoidance of art may be representative of misguided ideas about what "real men" do, perpetuated by the culture of co-educational schools.

Restrictive Definitions of Masculinity

Two rationales exist that offer explanations of boys avoidance of academic success as a consequence of their perceptions of masculinity. The first views gender as socially constructed (Scott, 1988; Connell, 1987). All children are born "the same" but sexist attitudes within society instill values in children that, consequently, dictate gender-preferences. As a consequence boys learn through stereotypes reinforced by society, the home, schools, teachers and texts that one form of masculinity exists - characterized by patriarchal, hegemonic, misogynistic values. If specific subjects - art as an example - are not represented within that masculine stereotype boys will subsequently avoid it.

Art and the theory of "multiple masculinities". Neo-masculinism views this interpretation as a "unitary" definition (Martino, 1995) and concedes it as being the dominant definition of masculinity existing in current educational theory. But it points out that not all boys agree with this "machismo" interpretation; many actively fight such constraints (Connell, 1987, 1989) but are given little credit for their efforts (Jackson and Salisbury, 1996). A second, more pluralist rationale posits that "multiple" - rather than singular - types of masculinity

exist within youth culture (Martino, 1995). Boys recognize a variety of ways of being a man, whether it be in alternative sexualities (Mac an Ghaill, 1994), academic success (Connell, 1989), or any number of other forms. Their efforts are nullified by the dominating effect of the "unitary" concept of manhood reinforced by society. With a re-definition recognising the presence of multiple types - or forms - of masculinity, cultural stereotypes of manhood that restrict boys' choices are challenged. In an effort to more widely reinforce this concept, significant, subject specific, work on "multiple masculinities" has been performed in English and Social Science, utilizing a de-constructionist/re-constructionist pedagogy (Martino, 1995; Nilan, 1995; Jackson and Salisbury, 1996). Similar strategies within art education would allow boys to be more generous in their acceptance of art as a worthwhile "manly" pursuit.

There is some indication that art possesses unique characteristics which would facilitate a "multiple masculinity" approach to pedagogical strategies. Collins (1977, 1978) used Beauvoir's (1949, cited in Collins, 1977) immanence and transcendence models to indicate the existence of gender-differences in art production. However, Flannery and Watson (1995) observed the sex of the

artist does not necessarily denote the style, or model, the student will utilize in making art. Sex of the artist does not necessarily classify the gender style of the art work - in art boys can acceptably produce art with "feminine" (or immanent) characteristics, and vice-versa. Art does not need to fight restrictive gender styles to allow boys to explore alternative forms of masculinity through production.

School's Poor Response to Boys' Unique Needs.

Connell (1989) suggested the indirect effects of schooling were most influential on boys' masculinity development: rather than curriculum content, the manner in which schools patterned authority and streamed academically directed boys performance and behaviour. The consequence, he noted, was a need to inculcate "masculinity education" into all facets of schooling rather than just the traditional "personal development" programs.

Implementing masculinity programs within art carries attendant problems associated with the historically narrow perspectives of gender discussion in education. Schools have been unresponsive to boys unique needs for some time. Bushweller (1996) believes that schools, in attempting to recognize the special needs of girls have ignored the boys. He argued that boys are different than girls; more

hyperactive, they often make bad first impressions, show off to gain respect from peers, act tough to mask feelings, grow bored and take a long time to invest trust in teachers. Pascal & Bertram (1995) and Soderman & Phillips (1986) hypothesize that boys learn to fail earlier than girls; they have slower intellectual development (citing Pavlidis, 1986) and the predominantly female teachers at elementary level do not tolerate their natural robust behaviour resulting in the early development of perceived behaviour and learning problems. These observations serve to illustrate that the gendered differences in art education in terms of participation and achievement detected by this study may not be the fault of the art curriculum or methods of art instruction - rather, a symptom of more complex socio-cultural issues associated with schooling itself.

5.2 Suggested Further Research

This study indicates that art education is not excluded from the social and schooling problems boys are facing; rather, in some undefined way, it is a participant in the set of circumstances that now see boys - in general - avoiding academic challenge. Boys are under-represented in art, they perform less successfully in academic

comparison to girls at art related tasks, and they appear to take an "easy way out" through choosing less demanding syllabuses and "giving up" in their studies. It seems imperative that this subject begin to explore the factors which affect boys' performance and participation in art education.

Given the paucity of research in this area case studies and quantitative/qualitative studies are needed that aim to build a greater understanding of boys in art education. It is important that such research should concentrate on 'relational' studies (Connell, 1995). By relational, it is meant that boys' issues should not be viewed as isolated from girls' educational concerns - there does in fact exist strong correlation between the two fields (Haywood & Mac an Ghaill, 1996). To investigate boys' problems as influenced by and influencing on girls' problems, helps to circumvent fears of "boys' studies" constituting a backlash against women in schooling (Mac an Ghaill, 1996).

Future studies should investigate if art offers boys goals that are worthwhile to masculine needs. In doing so studies should seek to develop a rationale - stressing the academic importance of art - that attempts to capture those elements most likely to appeal to boys. They should

continue to investigate how the genders differ in their relationship to art (Chalmers, 1977; Neperud, 1986) asking the question; does the possibility exist that boys perceive art as a "feminine" subject? If this is the case, is it possible to look to de-constructionist/re-constructionist pedagogies similar to those articulated by Martino (1995) and Nilan (1995) to combat this. Such efforts could lead to wider socio-cultural studies addressing boys' development of their concepts of gender and how schooling - through art education - could influence a more equitable gender interpretation by boys. Within this context, a comparative examination of art education curriculum content, structure and organisation in single-gender and co-educational schools may isolate curricular and pedagogical strategies which are specific to boys' development of appropriate concepts of "manly" behaviour

Finally, future studies should attempt to build a new philosophical basis for gender discussion within art education which recognizes boys as having unique educational needs.

References.

Alloway, N., Davies, B., Gilbert, P., Gilbert, R., King, D. (1996). Boys and Literacy: meeting the challenge. Commonwealth Department of Employment, Education, Training and Youth Affairs. Canberra, Australia.

Anderson, T. (1994) The International Baccalaureate model of content-based art education. Art Education 47 (2) 19-24.

Attenborough, D. (1996). Feminist interventions in teaching art history. In G. Collins and R. Sandell (Eds.) (pp.116-125) Gender issues in art education: Content, contexts and strategies. Virginia: The National Art Education Association.

Askew, S. & Ross, C. (1988) Boy's don't cry . Great Britain: Milton Keynes, Open University Press.

Austin, A. (1977a). Four critical years: Effects of college on beliefs attitudes and knowledge. San Francisco: Jossey Boss.

Austin, A. (1977b). On the failure of education policy. Change, 9, 40-45.

Bailey, L. (1996). Feminization of a school: Women in a boys' school. Gender and Education, 8, (2) 171-184.

Blaikie, F. (1994). Values inherent in qualitative assessment of secondary studio art in North America: Advanced Placement, Arts PROPEL, and International Baccalaureate. Studies in Art Education, 35, (4) 237-248.

Bradley, L. (1986). Art and the American boy. Art Education, 39, (5) 45-47.

Burgess, A. (1990). Co-education: The disadvantages for schoolgirls. Gender and Education, 2, (1) 91-95

Byrne, E. (1978). Women and education. London: Tavistock.

Bushweller, K. (1995). Turning our backs on boys. The Educational Digest January, 1995 9-12.

Clarke, P. (1997). So, where are the boys? Teacher: Journal of the British Columbia Teachers Federation. January/Feb, 1997.

Chalmers, F.G. (1977). Women as art viewers: sex differences and aesthetic preference. Studies in Art Education, 18, (2) 49-53.

Chalmers, G. (1988). The International Baccalaureate (I.B.) Art/Design program. School Art, 88, (9) 34-36.

Cohen, J. (1988). Statistical power analysis for the Behavioural Sciences. (2nd ed.) NY: Academic Press.

Collins, G. (1977). Considering an androgynous model for art education. Studies in Art Education, 18, (2) 54-62.

Collins, G. (1978). Reflections on the head of Medusa. Studies in Art Education, 19, (2) 10-18.

Collins, G. (1979). Women and art: The problem of status. Studies in Art Education, 21, (1), 57-64.

Collins, G. & Sandell, R. (1996). Gender issues in art education: content, contexts and strategies. Virginia: The National Art Education Association.

Cone, J. & Foster, S. (1996). Dissertations and thesis from start to finish; Psychology and related fields. Washington DC: American Psychological Association.

Congdon, K. (1996). Art history, traditional art and artistic practices. In G. Collins and R. Sandell (Eds.) (pp.10-19) Gender issues in art education: Content, contexts and strategies. Virginia: The National Art Education Association.

Connell, R.W. (1987). Gender and power. California: Stanford University Press.

Connell, R.W. (1989). Cool guys, swots and wimps: The interplay of masculinity and schools. Oxford Review of Education, 15, (3) 291-303.

Connell, R.W. (1995). Masculinities. Cambridge: Polity Press.

Dale, R. (1969). Mixed or single-sex schools? A research study about teacher-pupil relationships. (Volume I). London: Routledge & Kegan Paul.

Dale, R. (1971). Mixed or single-sex schools? Some social aspects. (Volume II). London; Routledge & Kegan Paul.

Dale, R. (1974). Mixed or single-sex schools? Attainment, attitudes and overview. (Volume III). London: Routledge & Kegan Paul.

Deem, R. (Ed.) (1984). Co-education revisited. Milton Keynes: Open University Press.

Department of Education and Science (1975). Curricular differences for boys and girls: educational survey no. 21
UK: London, HMSO.

Duffy, A. (1996). Girls now beating boys in traditional 'male' subjects. (1996, October 4). The Vancouver Sun.

Eisner, E. (1988). The role of discipline based education in American schools. Los Angeles: Getty Centre for Education in the Arts.

Flannery, K. & Watson, M. (1995). Sex differences and gender role differences in children's drawings. Studies in Art Education, 36, (2) 114-122.

Gilbert, P. & Gilbert, R. (1995, December). Technology of schooling and the education of boys. Paper presented at The Australian Sociological Association Conference, Newcastle, Australia.

Glenburg, A., (1988). Learning from data: An introduction to statistical reasoning. USA: Harcourt Brace Jovanovich.

Graham, P. (1974). Women in higher education: A biographical inquiry. NY: Columbia University.

Gray, A. (1987). Are girls the problem? Forum of Education, 46, (1) 34-46.

Helgadottir, G. (1991). Commentary: Gender issues in art education. Studies In Art Education, 32, (4) 248-249.

Haywood, C. & Mac an Ghaill, M. (1996). Schooling masculinities. In M. Mac an Ghaill (Ed.). Understanding masculinities. (pp.50-60). Buckingham: Open University Press.

Howell, D. (1997). Statistical methods for psychology (4th ed.). USA: Duxbury.

International Baccalaureate (1997) Art/design; Guidelines and instructions for visiting examiners. Wales: International Baccalaureate Curriculum and Assessment Office. February 1997.

Jackson, D. & Salisbury, J. (1996). Why should schools take boys seriously? Gender and Education, 8, (1) 103-115.

Jimenez, E. & Lockheed, E. (1989). Enhancing girls learning through single-sex education: Evidence and a policy conundrum. Educational Evaluation and Policy Analysis, 11, (2) 117-142.

Kruse, A. (1992). Single-sex settings and the development of a pedagogy for girls and a pedagogy for boys in Danish schools. Gender and Education, 4, (1/2) 81-103.

Lee, V. & Bryck, A. (1986). Effects of single-sex schooling on student achievement and attitudes. Journal of Educational Psychology, 78, (5) 381-395.

Mac an Ghaill, M. (1994) The making of men: Masculinities, sexualities and schooling. Buckingham: Open University Press.

Mac an Ghaill, M. (1996). Understanding masculinities: Social relations and cultural arenas. Buckingham: Open University Press.

MacCann, R. (1995). Sex differences at the N.S.W. Higher Schools Certificate after adjustment for the effects of differential selection. Australian Journal of Education, 39, (2) 163-188.

Martino, W. (1995). Deconstructing masculinity in the English classroom: A site for reconstructing gendered subjectivity. Gender and Education, 7, (2) 205-220.

Martino, W. (1994). The gender bind and subject English: Exploring questions of masculinity in developing interventionist strategies in the English classroom. English in Australia, 107, 29-44.

Martino, W. (1993). Boys' under-achievement and under-representation in subject English. Unpublished dissertation submitted in partial fulfillment for the degree of Master of Education (Hons), Murdoch University, Australia.

Men: Tomorrow's second sex. (1996, September/October) The Economist, 340, (7985) 23-26.

Neperud, R.W. (1986). The relationship of art training and sex differences to aesthetic valuing. Visual Arts Research, 12, (2) 1-9.

Nilan, P. (1995). Making up men. Gender and Education, 7, (2) 175-187.

Omerod, M. (1975). Subject preference and choice in co-educational and single sex secondary schools. British Journal of Educational Psychology, 45, 257-267.

Packard, S. & Zimmerman, E. (1977). Guest editorial: Sex differences as they relate to art and art education. Studies in Art Education, 18, (2), 5-6.

Pallotta-Chiarolli, M. (1990). The feminine stranger in a male school. Gender and Education, 2, (2) 169-183.

Pariser, D & Zimmerman, E. (1990). Guest editorial: Gender issues in art education. Studies in Art Education, 32, (1) 3-5.

Pascal, C. & Bertram, T. (1995). Who needs equal opportunities? (1995, February) Child Education, 9.

Reay, D (1990a). Girls' groups as a component of anti-sexist practices: One primary school's experience. Gender and Education, 2, (1) 37-43.

Reay, D. (1990b). Working with boys. Gender and Education, 2, (3) 269-282.

Riordan, C. (1990). Girls and boys in school: together or separate? NY: Teachers College Press.

Sacca, E. (1987). Artists' reflections on their students' sex stereotypes: Reconciling women's personal identity and conventions in art. Resources for feminist research/ Documentation sur la recherche féministe, 16, (4), 21-24.

Sacca, E. (1989). Invisible women: Questioning recognition and status in art education. Studies in Art Education, 30, (2) 122-127.

Sadker, M. & Sadker, D (1994) Why American schools are failing at fairness. NY: Prentis Hall.

Sadker, M. Sadker, D. & Steindam, S. (1989). Gender equity and educational reform. Educational Leadership, 46, 45-47

Schumacher, S & McMillan, J. (1993). Research in education (3rd ed.) NY: Harper Collins College Publishers.

Smith, R. (1995). Schooling and the formation of male student's gender identities. Theory and Research in Social Education, 24, (1) 54-70.

Soderman, A. & Phillips, M. (1986). The early education of males: Where are we failing them? Educational Leadership, 44, (3) 70-72.

Soerensen, A. (1992). The question of representation: Research in gender and education in Scandinavia. Gender and Education, 4, (3) 201-212.

Stables, A. (1990). Differences between students from mixed and single sex schools in their enjoyment of school subjects and in their attitude to science and school. Educational Review, 42, (3) 221-230.

Taylor, S (1981) School organization and sex-differences and change in adolescent self-esteem. Inquiry and Action in Education; Papers presented at the 1981 AARE Annual Conference (N.S.W., Australia).

Thompson, D.C. (1986). A new vision of masculinity. Educational Leadership, 43, 53-56.

Tidball, M., & Kistiakowsky, V. (1976). Baccalaureate origins of American scientists and scholars. Science, 193, 646-652.

Trickett, E., Castro, J., Trickett, P. & Schaffner, R. (1982). The independent schools experience: Aspects of the normative environments of single sex and co-educational secondary schools. Journal of Educational Psychology, 74, (3) 374-38.

Weiner, G. (1985). Just a bunch of girls. Great Britain: Milton Keynes.

Wyrick, M. (1996). Teaching feminist art and social activism. In G. Collins and R. Sandell (Eds.) (pp.126-133) Gender issues in art education: Content, contexts and strategies. Virginia: The National Art Education Association.

Appendix A.

Countries Represented in the Data.Europe (n_{countries} = 20, n_{subjects} = 615)

Switzerland (57)	Spain (17)
Germany (55)	Ireland (11)
U.K. (159)	Portugal (25)
Netherlands (54)	Poland (2)
Belgium (33)	Hungary (1)
Austria (36)	Russian Fed (7)
France (55)	Czech Rep (3)
Italy (26)	Finland (2)
Greece (20)	Norway (19)
Denmark (17)	Sweden (16)

South America (n_{countries} = 10, n_{subjects} = 202)

Colombia (77)	Chile (12)
Venezuela (12)	Argentina (1)
Ecuador (34)	Guam (4)
Brazil (20)	Peru (4)
Bolivia (5)	Uruguay (33)

North America (n_{countries} = 4, n_{subjects} = 1,047)

Untd States (845)	Canada (122)
El Salvador (14)	Mexico (66)

Asia (n_{countries} = 16, n_{subjects} = 290)

Singapore (22)	Indonesia (19)
Japan (59)	Philippines (44)
Taiwan (22)	Malaysia (12)
China (4)	Hong Kong (43)
Jordan (16)	Bahrain (25)
Oman (5)	Syria (0)
Untd Arab E (3)	India (7)
Thailand (8)	South Korea (1)

Others (n_{countries} = 9, n_{subjects} = 77)

Tanzania (14)	Australia (1)
Kenya (14)	Sth. Africa (6)
Sri Lanka (12)	Malta (5)
Morocco (1)	Egypt (21)
Lesotho (3)	

Appendix B.

Description of the I.B.D. Syllabus.

ART/DESIGN SYLLABUS: HIGHER AND SUBSIDIARY LEVEL

(Extract from the General Guide to the International Baccalaureate, 5th edition, 1985)

Nature of the Subject

Artistic expression is common to all cultures. From earliest times, human beings have displayed a basic need to make statements in a variety of graphic terms and to create objects which are aesthetically pleasing.

This urge to create has produced a vast tradition of experiential learning, which often defies precise definition. In no way does this diminish the value of the artistic experience as a learning process.

Part of the process of formulating a visual statement is the obligation to discover and to master techniques appropriate for the expression of that statement. Good design involves a search for a synthesis of aesthetic values and functional requirements, and should reflect some understanding of the complex language of visual symbols which form part of every society.

Art is not merely for pleasure or entertainment. Students may observe and personally experience how the arts can illustrate and comment on the human condition and on nature. Furthermore, the inspiration engendered by creative activity often becomes a driving-force in other studies and throughout life.

Stimulated by a knowledge of the rich artistic heritage of many cultures, students are aware that in this subject there is the freedom to create an intensely personal view of the world. In this special way, engagement in the arts promotes a sense of self-worth, and may make a significant contribution to the development of the harmonious person.

Aims

The aims of the programme in Art/Design are to:

1. provide students with the opportunities to develop the aesthetic, imaginative and creative faculties;
2. stimulate and train visual awareness, perception and criticism of the arts of various cultures;
3. enable students to discover, develop and enjoy means of creative visual expression in the studio and elsewhere, which are suited to their temperament and capabilities;
4. encourage the pursuit of quality, through training, individual experiment and persistent endeavour;
5. exemplify and encourage a lively, enquiring and informed attitude towards art and design in all its forms, both in history and today.

Performance Criteria

A. Studio (Practical) Work

Students will be expected to demonstrate:

1. an inquiring attitude towards a variety of visual phenomena, expressed in persistent research and regular studio work;
2. imaginative, creative thinking and feeling;
3. a sensitive appreciation of the medium in hand, and of its expressive potential;
4. a feeling for the fundamentals of design;
5. a comprehension of the aesthetic and technical problems encountered in studio practice;
6. the acquisition of sufficient technical skill to produce some works of quality;
7. an ability to select and present their own work appropriately.

B. Research Workbook (Appreciation and History of Art/Design)

Students should be able to:

1. demonstrate clearly in verbal and graphic terms how personal research has led to an understanding of the topics or concepts under consideration;
2. analyse critically the formal, technical and aesthetic qualities of the art forms studied;
3. relate this material to its cultural, historical and/or social context;
4. (at Higher Level) demonstrate the interrelationship between the personal research (Part B) and the studio work (Part A).

Programme Outline

Teachers will design their own programme, with reference to three factors:

- the cultural background and personal needs of the student
- the location of the school and the influences of indigenous culture
- the teacher's own training and special skills.

Because these factors vary considerably from school to school, the precise programme content will not be specified. In accordance with the Aims and Performance Criteria listed, each programme will reflect the distinctive multi-cultural perspective of the International Baccalaureate in a different way. Teachers will avoid a programme which is based on merely one national or traditional concept of the visual arts.

Appendix C.

Assessment Criteria for the I.B.D. Art Syllabus.

PART A: STUDIO (PRACTICAL) WORK

For both Higher and Subsidiary Level there are six assessment criteria:

1.	IMAG	Imaginative and creative thinking and expression.	35%
2.	PERS	Persistence in research.	20%
3.	TECH	Technical skill.	15%
4.	MED	Understanding of the characteristics and function of the chosen media.	10%
5.	DES	Understanding of the fundamentals of design.	10%
6.	GROW	Ability to evaluate own growth and development.	10%

PART B: RESEARCH WORKBOOKS

For both Higher and Subsidiary Level there are four assessment criteria:

1.	IND	Independent research.	35%
2.	CRIT	Critical appreciation of the formal, technical and aesthetic qualities of the art form studied.	25%
3.	AWA	Awareness of cultural/historical/social context.	25%
4.	ESR	Experimental Studio Research.	15%

In order to determine the degree to which the candidate has fulfilled each of the criteria, five levels of achievement – ranging from 5 (high) to 1 (low) – have been identified and described under each heading.

PART A: STUDIO (PRACTICAL) WORK

Imaginative and creative thinking and expression (IMAG)

<u>Level</u>	<u>Descriptor</u>
--------------	-------------------

- | | |
|---|--|
| 1 | The work shows that the student has worked only under supervision, showing little interest or empathy for the projects. The work is mundane, derivative and without imagination. |
| 2 | The student has worked in a manner which is largely derivative and not very inventive. Nevertheless, the work contains some imaginative elements. |
| 3 | The work tends to be mundane, but the student has investigated and found ways of expressing ideas and feelings with some imagination and with varying success. |
| 4 | There is an individual approach to the work, which is sometimes rich in imagination. The work shows that the candidate has searched for new ideas and has found some original solutions. |
| 5 | The work reveals a consistently imaginative approach, a creative response and an unusual ability to develop ideas with intelligence and originality. |

Persistence in research (PERS)

<u>Level</u>	<u>Descriptor</u>
--------------	-------------------

- | | |
|---|--|
| 1 | The amount of work presented is insufficient, shows a limited number of ideas, a few of which may be pursued to a satisfactory conclusion. |
| 2 | A limited amount of work reflects some development of personal lines of research but there are few innovative ideas and much work is unresolved. |
| 3 | A satisfactory volume of work has been produced. The candidate has researched a number of personal projects in different media and some of them have been brought to a satisfactory conclusion. |
| 4 | A good volume of work shows an interesting range of ideas, and projects are pursued in a variety of media. Many of these are well followed through to a successful conclusion. |
| 5 | A considerable body of work reflects an independent and original pursuit of a wide variety of ideas in different media. The research is personal and adventurous and projects are seen right through to a successful conclusion. |

Technical Skill (TECH)**Level Descriptor**

- | | |
|---|--|
| 1 | There is no evidence of the acquisition of technical skill. The work is badly executed and none of it is satisfactorily completed. |
| 2 | There is some evidence of the acquisition of skill but this has not been sufficiently developed to produce works of technical quality. |
| 3 | There is evidence of sufficient skill having been acquired to enable the student to develop and express some ideas effectively and occasionally to produce work of technical quality. |
| 4 | There is evidence of skills having been acquired which enable the student to develop and express most ideas effectively and to produce work of good technical quality. |
| 5 | There is evidence of considerable skill having been acquired, enabling the student to develop and express ideas effectively, resulting in work of consistently high technical quality. |

Understanding of the characteristics and functions of the chosen media (MED)**Level Descriptor**

- | | |
|---|--|
| 1 | The work shows that the candidate does not have any understanding of the characteristics of the media. |
| 2 | The work shows that there is some understanding of the characteristics of the media. |
| 3 | The work shows some understanding of the characteristics of the chosen media and there is an attempt to relate it to its appropriate function. |
| 4 | The work shows the various characteristics of the chosen media have been considered and appropriate choices have been made. |
| 5 | The medium is handled with great confidence and is appropriate to form and function. |

Understanding of the fundamentals of design (DES)

In view of the persistently shifting and conflicting definitions of the term "design" in art education internationally, we propose the following, for the purposes of this assessment:

An understanding of the fundamentals of design is the ability (intuitive or learnt) to recognise the significance of elements such as colour, line, tone, form, and to arrange or relate these elements so as to achieve harmony, pattern contrast, rhythm, appropriate to the artist's/designer's intention and to the function of the product. The fundamental principles of design may be applied in different ways, according to various cultural traditions.

Level Descriptor

- | | |
|---|--|
| 1 | The work shows little understanding of the significance of the elements of design (eg line, colour, texture). The principles of design (eg rhythm, contrast, harmony) have not been applied. |
| 2 | The work shows an understanding of some of the fundamentals of design but this is not well applied. |
| 3 | Most of the work demonstrates an understanding of the fundamentals of design although these might have been applied quite mechanically. |
| 4 | In most of the work the candidate has successfully integrated the elements and principles of design. |
| 5 | The elements and principles of design are an integral and consistent part of the candidate's work. |

Evaluation of own growth and development (GROW)¹

Level Descriptor

- | | |
|---|--|
| 1 | The candidate is unable to identify own strengths and weaknesses, or to discriminate between degrees of quality in own work. |
| 2 | The candidate needs assistance to identify own strengths and weaknesses, to discriminate between degrees of quality in own work. |
| 3 | The candidate is usually able to recognise own strengths and weaknesses and therefore can to some extent select work and discuss own development. |
| 4 | The candidate is able to recognise own strengths and weaknesses and to select and discuss own work. He/she is able to identify works of varying quality and, in most cases, can explain independently the reasons for his/her personal development. |
| 5 | The candidate has a clear understanding of the reasons for his/her development, and is able to justify the selection of own work. He/she is able to identify own works of varying quality and to discuss their relationship within this development. |

¹ If the candidate cannot present his/her work personally, and has to send a portfolio to the nearest IB examiner, this must include a taped interview (cassette) of the candidate by the teacher, who will ask the sort of questions suggested in the Subject Guide (page 13).

PART B: RESEARCH WORKBOOKS

Independent Research (IND)

<u>Level</u>	<u>Descriptor</u>
--------------	-------------------

- | | |
|---|---|
| 1 | There is no evidence of personal research or interest. The minimal material presented is unoriginal and the purpose of the workbook has not been understood. |
| 2 | A workbook may be filled, but it is derivative and has been compiled unimaginatively. There is little evidence of the personal research that would lead to an understanding of the topics/concepts under consideration. |
| 3 | Sufficient relevant material has been selected and recorded. The workbooks reveal an understanding of the topics/concepts under consideration, but they may lack depth or may be dependent on convenient sources. |
| 4 | The workbooks demonstrate a consistently good standard of personal research and a sound understanding of the topics/concepts under consideration. |
| 5 | The workbooks show the use of appropriate sources and means to research the topics/concepts under consideration. Written and graphic material is combined to produce original and imaginative journals. |

Critical appreciation of the formal, technical and aesthetic qualities of the art forms studied (CRI)

<u>Level</u>	<u>Descriptor</u>
--------------	-------------------

- | | |
|---|--|
| 1 | The material demonstrates that the candidate is unable to describe the forms and characteristics of the material studied. |
| 2 | The material demonstrates an ability to describe the formal characteristics of the material studied but not to analyse them. |
| 3 | The material demonstrates a developing critical appreciation and some understanding of formal aspects of the material studied. |
| 4 | The material demonstrates an ability to analyse and discuss the comparative values of different works of art with some ease and shows a critical understanding of their aesthetic qualities expressed in a considered opinion. |
| 5 | A critical vocabulary has been developed and effectively employed. An understanding of form, technique and aesthetic qualities enables the candidate to organise and analyse the material studied in written and graphic terms and to arrive at personal and original conclusions. |

Awareness of the cultural/historical/social context (AWA)

<u>Level</u>	<u>Descriptor</u>
1	The workbook is a scrapbook of unrelated material.
2	There has been some attempt to relate the studies of art/design to the cultural/historical/social context, with varying success.
3	The studies of art/design are generally related to the cultural/historical/social context, but in a rather conventional manner and without consistency.
4	A consistent effort has been made to relate the studies of art/design to the cultural/historical/social context in an individual manner.
5	The material shows a consistent awareness of the relationship of the art/design studies to various cultural/historical/social contexts.

Experimental Studio Research (ESR)

<u>Level</u>	<u>Descriptor</u>
1	The experimental studio research has been very erratic and only minimally related to the verbal and visual content of the workbook.
2	There is a balance of verbal and visual material, and a few creative ideas have been explored through experimental studio research.
3	There is evidence of frequent experimental studio research, although it may not be related to the verbal and visual content of the workbook.
4	There is evidence that the candidate has made consistent attempts to relate a substantial body of experimental studio research to the verbal and visual content of the workbooks.
5	There is a natural, consistent and close relationship between experimental studio research and the verbal and visual content of the workbooks.

Appendix D.

Calculation of Familywise Error Rate.

For the purpose of this study, three questions were being assessed for significance; two main effects (gender and syllabus) and one two-way interaction (gender x syllabus).

With the necessary three trials (^{NT}) and an alpha of $\alpha = .05$,

$$\begin{aligned}\alpha_{FW} &= 1 - (1 - \alpha_{PC})^{NT} \\ &= 1 - (1 - .95)^3 \\ &= >.15\end{aligned}$$

There existed a .15 (15%) probability that one of the significant results had incorrectly rejected a null hypothesis (that is, committed a Type I error).

Appendix E.

Calculating Effect Size

A priori power analysis for this study required estimation of a population standard deviation (σ), and effect size (d).

Population standard deviation. Based on the limiting range of an 8 point scale for grade, a $\sigma = 1.50$ was considered appropriate.

Effect size. Howell (1996) stipulated that an approximation of effect size was preferable to arbitrarily assigning one of Cohen's (1988) three levels of d . It was considered that on a score range of 0 - 7 a difference of $\pm .6$ between boys' and girls' mean scores would represent a considerable difference in grades. A Cohen's $d = .40$ was calculated using the formula, $d = \frac{\mu_1 - \mu_2}{\sigma}$

σ

. This effect size conformed roughly to Cohens' (1988) "middle" size; larger effect sizes would have increased the danger of Type II errors, while a smaller effect size would have allowed for significant results to be found that would not, in practice, be taken seriously.

Appendix F.

Correspondence with the International Baccalaureate
Organisation.