

THERE IS AN IMPORTANT PLACE AND VALUE
FOR SELF-DIRECTED LEARNING
BY SECONDARY ART TEACHERS OF CERAMICS

by

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Abstract

This study identifies the current need for teachers to be aware of the potential demand upon them for job retraining and offers one possible approach to the problem of adjustment to new teaching assignments through the use of a self-directed learning (SDL) plan. The study is based upon the writer's five-year experiences in which she designed and implemented a SDL plan in ceramics which would enable her to teach ceramics at the secondary level. The main characteristics of an SDL plan, the process of gaining skills and knowledge, and the evolution of the ceramics program are discussed. Visual and verbal examples are included to document important procedures and processes. Conclusions are offered that SDL is a feasible, practical and flexible learning approach that has benefits for both teacher and student learners. Conclusions are that SDL can be adapted to others' needs in that the plan can be modified to be used in a number of subject areas.

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Chapter I

INTRODUCTION

BACKGROUND TO THE STUDY

For some time urban teachers in all areas of education have occasionally been asked to teach subjects for which they have received little or no formal training. While this demand seemed rare in the past it appears to be more common in recent years. Today the main reason behind the need for teachers to teach new areas appears to be connected with the declining school population at most levels in the lower mainland. When fewer students attend schools, fewer teachers are needed to teach in those schools. Also, as a consequence of fewer students, fewer elective classes are offered. Because fine arts courses are elective in most schools they are very much affected by smaller school enrollments and reassignment of teachers within a system becomes commonplace. Thus, a fine arts teacher, instead of teaching three painting classes may suddenly have to teach one painting, one ceramics, and one textiles class. The ceramics and textiles classes may have been taught in the past by another art specialist teacher who is no longer staffed by the school. As well as being asked to teach new and additional fine arts courses, art teachers may also be asked to teach English, Mathematics, or any other subject. Good administrators use the human resources available to them in the most flexible manner possible so that teachers who have training in many subjects or who are able to retrain if necessary are likely to be chosen for job positions over someone less adaptable.

The writer's interest in this topic of: (a) being adaptable; (b) responding to sudden demands; and (c) assuming new professional responsibilities, stems from a personal experience which occurred in 1976. She was hired by a metropolitan school board to teach general art from grade eight to twelve as well as ceramics for the same grade levels. Because the writer had no previous experience in ceramics it was necessary for her to learn the skills and knowledge needed before teaching could begin. The writer's background in education and teaching up to the time of her appointment included a Bachelor of Education degree at the Elementary level from The University of British Columbia (U.B.C.) which was granted in 1967. The writer taught art and general grade four curriculum subjects for three years in British Columbia. The writer then moved to Toronto, Ontario where she taught art in a junior secondary school for five years. She then returned to U.B.C. to complete a fifth year of Education and was granted a Bachelor of Education degree at the Secondary level in 1975. The writer taught at Kitsilano Secondary School for the period of the study.

Because the job commenced in September and she was hired in August the writer had limited time and few options on such short notice in respect to classes she might take that would help her develop new technical information. The problem of limited time and courses could have been solved in a variety of ways. The writer chose, however, to deal with the situation by devising a personal plan and schedule which would enable her through a self-discovery technique to acquire some of the technical, aesthetic, and intellectual abilities needed to teach ceramics at the secondary level. The seemingly simple approach to a

complex problem led to solutions or discoveries that other teachers might find useful in adapting to uncommon challenges.

The contention or proposition being presented and explicated in this report is that with a new secondary art curriculum about to be put into effect in B.C.'s secondary schools and with the possibility of being assigned new teaching areas today's teachers must be prepared to retrain. Although there are many solutions to job retraining, the SDL approach could play a predominant role for many and, as such, this report offers a model of the SDL approach to which teachers may refer for guidelines, suggestions and procedures.

PURPOSE OF THE STUDY

This study is designed specifically to illustrate one way of dealing with a retraining problem faced by an art teacher in a metropolitan school system. The study is further specialized in that the described area of retraining is ceramics. However, it is probably safe to assume that the declining enrollment situation is not unique to one system and could, in fact, occur in any major city in North America. The existence of a declining population is probably going to continue to be a pressing problem for some years and as such will affect not only teachers of fine arts but all educators in the public school system. To the extent that many teachers in a variety of geographical locations may be faced with retraining, this study could provide some valuable information on one approach to solving the problem of retraining or adaptation. The solution of pursuing self-directed learning has been dealt with minimally in art education literature and thus this study may

have ideas which can be isolated and applied to other areas of education. In addition to learning personally a new plan of study many teachers may see the value in encouraging their own students to be more self-directing in their own studies.

The report of this study is organized into five main chapters. Chapter one deals with the background to the study and the writer's personal interest in the topic. In it the purpose and organization of the study and the definition of operative terms are examined. Chapter two will provide a philosophical premise for, and an attitude toward, teaching ceramics at the secondary level. Chapter three will present the steps involved in devising a self-directed learning plan. Chapter four will demonstrate how the self-directed learning plan in ceramics was applied specifically to the areas of classroom organization, practical skills, factual knowledge and program planning. Chapter five will discuss the evolution of the program. The study will conclude with a review of the findings, some advice to teachers, and photographic and written examples to validate the writer's claims of accomplishment of her objectives.

DEFINITION OF TERMS

There are two main terms in this thesis which require defining: (1) ceramics, and (2) self-directed learning. The first term, ceramics, is defined by Robert Fournier (1973) as a word derived from the Greek *Keramos* which means 'burnt stuff' or 'earthen vessel'. Today the term is applied to any articles made permanent by heat at temperatures hot enough to produce a glassy state or coating. He further defines ceramic sculpture as those items which are not pots but are objects solely

concerned with form, invention and decoration. Fournier (1973) says that pottery is a more narrow term than ceramics and applies only to hand-made containers. Because the art activity fundamental to this study is concerned with more than hand-made containers and includes some discussion of glaze making, sculpture, and wheelwork the writer has chosen the term ceramics rather than pottery to define the area of study.

The second term, self-directed learning (SDL), refers to any learning done by an individual in which the individual has decided what, how, and when something is to be learned. For various reasons much of what we need to learn at some stage or other cannot be readily learned in formal learning institutions. Some examples of learning which may have to be self-directed include developing a personal teaching style or acquiring information on the job. Many educators feel that SDL is the best way to learn something because it makes people less dependent on teachers and institutions. Although teachers and institutions still play an important role in guiding students to become more personally involved in and committed to learning. Such ideas have been clearly dealt with by J.S. Bruner (1961) (Pappas, 1970), who writes about the benefits of self-discovery learning. He begins by defining self-discovery learning as being any form of obtaining knowledge for oneself by the use of one's own intellectual abilities in a personally developed learning approach. He further says that discovery learning is characterized by having a well prepared mind and the ability to rearrange and transform facts in such a manner as to be able to gain new information and insights from knowledge which is already evident. Bruner sees the learner benefiting from discovery learning in four main respects. The

learner experiences: (1) an increased intellectual power, (2) a change from extrinsic to intrinsic rewards, (3) the learning of a way or a technique of discovery, and (4) being able to remember more readily information which is discovered by oneself (pp. 90-101).

Firstly, the increased intellectual power occurs because the discovery learning process forces the learner to organize the information he is unexpectedly meeting in a regular and related manner and also makes the information more workable in problem solving. Secondly, Bruner (1961) (Pappas, 1970) sees the self-discovery learner as benefiting personally by being able to replace the rewards offered by teachers and parents for learning something with learning as its own reward. Thirdly, he adds that learning the techniques of discovery comes from the experience of trying to learn the process of inquiry. In other words, the more one practices the act of inquiry, the more likely one is to encounter a personal style or pattern of problem solving which can be applied successfully to any learning situation. Finally, he says that the activities which characterize discovering things for oneself seem to make information learned more easily accessible in the learner's memory. Thus the information can be more readily recalled and used than information gained through other methods.

Another strong proponent of self-directed learning, Malcolm Knowles (1975), states that not only do people learn better through SDL, but it suits people's psychological development better than teacher-directed learning. As we mature and develop, our natural inclination is to be more responsible for our lives and therefore more self-directing in all areas. Learning in this style promotes a sense of self-esteem in that the motivation comes from within the individual rather than from

external sources. Knowles (1975) states that a further long-term reason for being skilled in SDL is that because we live in a world which changes so rapidly we cannot be content as educators only to transmit knowledge which is commonly known to our students. We must teach students to develop the skills of inquiry so that when they leave school they will have not only a bank of knowledge but the ability to acquire new knowledge as necessary. Education must be seen as a lifelong process because schools can no longer provide students with all the information they will need for the rest of their lives in this highly technological age.

Being aware of what SDL meant or implied was the writer's first step toward devising a successful SDL learning plan. Before beginning a SDL study in ceramics, however, the writer had to establish a philosophical basis and some attitudes towards the place and value of ceramics in the art curriculum. Educational justification for including ceramics in the secondary school will be examined in chapter two.

SUMMARY

Educators today face the problem of retraining at some or many stages of their teaching careers. Currently, teachers are involved in retraining in the types of subjects they teach because of declining school populations. Fewer teachers are hired for "specialist" areas when "generalists" can be assigned to instruct in many subjects. In the future, teaching will change further by the addition of new course material that better reflects the needs of contemporary students. For example, just as teachers in the past few decades have had to prepare to teach "new math" courses, teachers in the future will need to learn more

about computers and computer-related material. This writer's aim has been to provide one method for teachers to use in order to facilitate the retraining process. The self-directed learning approach used in this study was designed to be referred to as a model which could be translated or transferred from the ceramic area to any other. With this study as an example of how to devise a personal self-directed learning plan, interested educators could be successful in dealing with their retraining problems.

Chapter II

WHY TEACH CERAMICS AT THE SECONDARY LEVEL?

JUSTIFICATION OF CRAFT PROGRAM APPROACH

Justifying the inclusion of any course in the school curriculum requires presentation of some clearly defined reasons and the ability to show students' need for knowledge in the area. This is particularly true of the fine arts. For the sake of subject classification and examination, most ceramics programs are generally categorized as "craft" programs. The reason for this label appears to be that in a ceramics program certain methods, skills and techniques are taught to ensure that students have some sound knowledge of how to do things. The obvious danger in classifying and especially in practising the idea of teaching a "craft" course is that one will end up teaching or learning skills simply for their own sake which, in the end, has very little to do with teaching or learning how to respond to art. In describing justifications for including any art program in the school curriculum, Elliot W. Eisner (1972) says that studying and making art is beneficial to students in several main ways. He maintains that art provides a valuable leisure time activity, allows emotions and feelings to be expressed through the making and viewing of visual forms, develops creative thinking, contributes to a better understanding of academic areas and encourages physical co-ordination. Eisner (1972) thinks that art's primary and most important educational justification is its ability to enlighten and educate the individual to his experiences as a human being. He claims that art is unequalled in its ability in this

area. He illustrates his philosophy clearly when he says, "Art not only functions as a vehicle for the articulation of sublime visions, it also takes those visions most characteristic of man, his fears, his dreams, his recollections, and provides these too with visual metaphors" (p. 11). He continues, "Art also provides the bonds that strengthen ritual, it breeds affiliation through its power to move the emotions and generate cohesiveness among men. It discloses the ineffable and enlarges our consciousness" (p. 16).

Edmund Burke Feldman (1970) also shows his concern with art as an expression of the human condition when he says the following regarding primitive art: "Primitive art continuously presents us with visual solutions to human needs, fears, and aspirations. It helps locate the idea of art at the center of life rather than at its periphery" (p. 16).

He adds this thought about contemporary art:

Since art is everywhere around us--in the design of the large-scale and the small-scale environment--teachers should try to enlarge their pupils' concept of art so that they can help bring about its integration--naturally and officially--with the rest of our common existence. They must learn to perceive form and meaning not only in pictures but also in every aspect of personal and social life. (p. 21.)

Both of these art educators convince us that art involves the visual representation of man's values, feelings, dreams, and surrounding conditions (natural, social, cultural, and religious) and thus an art program involving any particular medium must enable and encourage students to participate in the making of art rather than a craft object. What is meant here by craft object is any product which has a planned outcome and has a predictable end result. What is meant by art is a piece of work which grows and changes as the process evolves and which also has a reasonably predictable result. End results in art are

usually not totally preconceived. While the process of developing skills is an important part of any art program because it enables one to better express and execute ideas, it can become the total focus for many students learning to work on the potter's wheel. From the first moment of success, many students want to totally abandon handbuilding projects or other aspects of the program such as glaze making or ceramic art appreciation in order to devote all their energies to producing twenty-five identical coffee mugs. While making twenty-five identical mugs is quite a challenge for any beginning ceramics student it, of course, narrows the student's art experience considerably if done to the exclusion of everything else available to him/her. We, as teachers, want students to produce well designed and well executed pieces of work that take time and skill to some degree. We do not, however, want students to produce predictable and meaningless pieces which in no way reflect a student's personal involvement with his or her own imagery and art development. Doing the same thing over and over again obviously involves very little problem solving. Problem solving requires thinking and experimenting before any satisfactory results appear. Some students can and do assume that the main reason for taking an art course is to simply "have fun and not work too hard." These students naturally balk at having to do any hard work. It has been the writer's experience, however, to find that most students, when provided with problems suited to their age and ability level (these problems may be teacher and/or student designed), soon respond to the challenge with eagerness and enthusiasm. In spite of how it can sometimes appear, most students in secondary classrooms are not apathetic about how they spend their school time and do want a chance at self-expression and an opportunity to grow

and develop beyond their current art experience, knowledge and skill. One of the most rewarding aspects of teaching a subject like ceramics is that it does allow the student both to have fun and to develop visual and aesthetic awareness on his/her way to becoming a more artistically educated person. As long as students and teachers see crafts as a means to art, the craft program approach can be satisfactory and useful.

Having stated in the preceding paragraphs my belief, coupled with beliefs of others, that ceramics can be a valuable study area for enabling students to develop skills which they can use to express their own art ideas, the writer would like to further add some equally important reasons for teaching ceramics at the secondary level. These reasons will cover four main areas: (a) student attitudes and interests in art during adolescence; (b) the pervasiveness of ceramics; (c) the co-operative action developed among students through participation in this kind of program, and (d) the opportunities provided for developing personal imagery through ceramic art.

STUDENT ATTITUDES

It has been the writer's experience to find that many adolescent students appear to be either bored or frustrated with traditional drawing and painting classes. There are many possible reasons for this situation to occur, including being unstimulated by poorly planned and taught classes, being unchallenged by doing the same type of drawing activities for too many years, being frustrated by a lack of technical ability, being unable to develop the personal motivation needed to improve skills, and being unsatisfied with making something which many students consider valueless (drawings). The writer makes this statement

based on the fact that so many students do not take drawings home and do not seem to care about what happens to them. Producing expressive images through drawing has great personal value for the student if he will commit the energy and concentration needed to do creative work. Added to the above is the problem of living in a society in which people demand new and different entertainment every minute. Art students often want to use a new and different material or tool for its novelty value rather than deal with an old and usual material in its entire complexity. The problem, of course, in this type of situation is that the student becomes as quickly bored with the new as he does with the old. Drawing, it seems, falls into the "old" category while ceramics falls into the "new". Although some drawing is usually done in a ceramics class, there is in general less emphasis on it. Because of the lack of drawing demanded in ceramics many students who feel that they are weak or poor in art because they cannot draw well are attracted to this field of study. Some of the other attractions include a desire to work in a new area, a need to succeed at something as challenging as mastering the potter's wheel, and a desire to express oneself in a fairly direct and easily manipulated medium. Drawing is more easily manipulated than ceramics but many students seem unable to draw what they see in front of them and resort to reproducing symbols for objects which they developed in earlier years. Perhaps the inclination of most educators to foster activities inherent to the left hemisphere of the brain explains why students have difficulties drawing what is in front of them. Betty Edwards (1979) has researched the activities of both sides of the brain and states the following:

The dominant left verbal hemisphere doesn't want too much information about things it perceives--just enough to recognize and categorize. The left brain, in this sense, learns to take a quick look and says, "Right, that's a chair (or an umbrella, bird, tree, dog, etc.)." Because the brain is overloaded most of the time with incoming information, it seems that one of its functions is to screen out a large proportion of incoming perceptions. This is a necessary process to enable us to focus our thinking and one that works very well for us most of the time. But drawing requires that you look at something for a long time, perceiving lots of details, registering as much information as possible--ideally, everything (p. 76.)

Many students coming from elementary schools will have had some exposure to clay usually in the form of handbuilding, but in general their experiences are often limited. If these early experiences are positive, they will probably serve to motivate a student to want to learn more and in greater depth than was previously possible for them. Clay, it seems, has an almost universal appeal for people of all ages everywhere. Most people find a lump of clay irresistible to touch and change under one's fingers. As well as providing an irresistible medium with which to work, ceramics provides a chance to work with a machine, the potter's wheel. Adolescents, in general, seem to enjoy working with machines and thus the wheel satisfies another natural interest of this age group. Clay can also be in some ways an answer to some of our students' needs for instant results. Clay can be changed and formed so easily and quickly that many satisfying results can appear in moments. I am not suggesting, of course, that three second efforts be the basis of any art program, nor do I condone "The Instant Results" attitude so prevalent today. What I am saying is that fast results can be an encouraging way to begin a more in-depth study for many students. In time all students will grow into working on longer term assignments and will realize that in many ways ceramics from beginning to end is one of

the longest of art procedures. This is especially true of working on large pieces which often take many days to construct and many more days to dry, fire and glaze before an end product appears. Hopefully, students working on large pieces will have adopted a new attitude toward their work which will allow them to be patient and self-disciplined enough to provide the time and effort needed to produce and finish a quality piece of work. The attitudes of patience and self-discipline will also be carried away with the student long after the ceramic course is over. Along with positive attitudes, students who take the time to master the skills needed to succeed in any medium often gain a sense of competency and satisfaction regarding their capabilities. These feelings not only make students feel good about themselves but add to their sustained interest in art activities because we all enjoy feelings of success and self-worth.

PERVASIVENESS OF CERAMICS

Ceramics is an ancient art form which has been practised in some form throughout most countries in the world. Ceramics is also a contemporary art form still being practised around the world. Because ceramic art is both old and new it provides a rich area of historical and cultural study. If we, as teachers, are concerned about the teaching of historical and cultural aspects of art then ceramics makes an ideal area to include in secondary school art curriculums.

Our school populations reflect the fact that Canada is a country of many races, nationalities and cultures. Most schools have a variety of Asian, European, North American Indian, and East Indian students. The common practise of ceramic art among so many countries gives us a mutual

area of art to compare and contrast. Students can gain a respect for and an understanding of other cultural groups through the study of the arts of any particular group. All of us need as many opportunities as possible to appreciate and live peacefully with our fellow man. The study of ceramic art may be a small way of contributing to better understanding among diverse groups.

CO-OPERATIVE ACTION

In this age of emphasis on the individual, students can often end up thinking only in terms of their particular and personal art project. While it is important to have a serious involvement with one's own work, it is also important to participate in the whole social experience of the classroom. A ceramics class fosters the sharing of ideas, responsibilities and social interactions. All three of these areas usually need some guidance from the teacher in that many students are not used to expressing art thoughts verbally, are not used to taking a large part in the smooth running of a studio and are used to socializing to the detriment of their work and that of others. In guiding students through these areas, students often develop much neglected critical and analytical skills in art. Students are encouraged to use proper vocabulary, terms and language associated with ceramics thus enabling them to say more precisely what they are thinking. There are many ways to teach these skills including role modelling, visual aids (vocabulary sheets, proper labels) and group critiques and discussions. Helping students to be more responsible for their own classroom environment can be achieved by allowing them to participate in all areas of studio organization.

This includes clay preparation, recycling and storage, glaze preparation, kiln firings, care and maintenance of tools and equipment, artistic display of finished work, keeping track of supplies needed and any other procedures pertinent to the classrooms. To ensure that all this participation takes place, it is essential to have some organizational routines established. Handouts on various processes and demonstrations of methods often help. Rotating schedules of some duties such as kiln loading and glaze making ensure that everyone gets an equal opportunity to be involved. Students should keep their own personal records of firings and classroom routines.

PERSONAL IMAGERY

Ceramics provides another excellent opportunity for students to develop their own working style and personal imagery. Personal imagery is a problem initially for most students and takes time and hard work to develop. Students often come to class with a mental storehouse of tired and cliched images copied and borrowed from assorted sources. As teachers we can certainly encourage students to use these ideas as jumping off or starting points towards developing a personal bank of images. We can also provide students with stimulation from a myriad of other sources which in particular helps the student who claims he/she cannot think of anything to do that is original to him/her. The sources to use include nature, man-made environments, buildings, other artists' work, poetry, literature, science, music, societies, life experiences, etc. Without having to work in a vacuum, students find they have a wealth of ideas to choose from. Once students use their own ideas for

their work, they quickly realize how much more satisfying their work becomes and how boring cliches are.

In conclusion, ceramics can provide the secondary student with skills, possible mastery of a new medium, and an interesting area of art to study both historically and culturally. Ceramics can promote brotherhood as it is a shared art subject by many people around the world. Working in a ceramics room allows positive attitudes to develop. Attitudes about idea sharing, responsibilities and self-discipline are often fostered. Students have the opportunity to be self-expressive while developing a bank of personal images. Students learn new techniques and skills while making ceramic art. The making of an object in ceramics demands many decisions and thus fosters independent thinking and evaluation. Finished art products are a way of communicating ideas and feelings to the rest of the school and community when put on display. A ceramics classroom can be a place where students have good experiences, learn a great deal about the technical and aesthetic aspects of ceramic art, and leave feeling positively about themselves. They will leave having had a good educational experience which not only enables them to be more artistically educated but also to have a continued interest in learning.

Once the writer was convinced on a philosophical basis that ceramics did have a valuable place in the curriculum and could be an educationally justifiable vehicle for achieving several of the objectives of art education, she devised a self-directed learning plan (SDL) in order to gain the skills and knowledge needed to teach a ceramics program. The SDL plan will be outlined in the following chapter.

Chapter III

DEVELOPING A SELF-DIRECTED LEARNING PLAN

In determining the potential for success or failure of an individual about to begin a SDL plan in any subject, two main issues must be considered. The first deals with the personal characteristics which aid and facilitate the process while the second deals with the order in which steps are taken and the system of proceeding used. The order of events is important because it helps to minimize mistakes and time wasting, and to maximize positive results and quick mastery of skills and knowledge.

Everyone has the potential to be successful in SDL, but certain personal characteristics are valuable to possess or develop in order to make the whole process easier. These characteristics include the ability to be: (a) self-motivated; (b) self-disciplined; (c) persistent; (d) responsible for one's own learning; (e) capable of seeking out materials and resources available; (f) able to seek help when needed; (g) self-critical; (h) able to assess one's own growth and progress; and (i) able to make changes and adjustments when needed. One need not possess all of these characteristics equally but should at least be aware of the need for them throughout the SDL process.

When the writer was doing the major part of her SDL in ceramics she was not consciously aware of the order of steps taken in devising her learning plan. A clearer picture of what took place emerged after taking time to recall and reflect. Knowles' (1975) information and guidelines for learners and teachers also proved invaluable as a source

of clarifying the steps involved in SDL. The SDL process is analyzable according to these five steps. At the onset, an overall idea of what needed to be learned was established. What needed to be learned, in very general terms, was dictated by the initial problems encountered. Then, more specific goals and learning objectives were identified through close examination of the initial problems. After establishing some specific goals the writer examined and recalled some learning strategies and styles which had been useful in the past and then isolated some for future use. A conscious effort was then made to locate and have access to material and resources which would prove helpful. Finally, the writer collected and tried to validate evidence of the accomplishment of her objectives.

The writer will proceed in the following paragraphs to elaborate upon the five steps taken in her SDL process. The four main initial problem areas will be examined and then specific goals applied to each area will be outlined. Once goals have been established the writer's personal learning strategies and styles will be examined. Learning sources and resources will be included as well as evidence of the writer's accomplishment of her objectives.

The initial problems encountered in SDL were classified into four main areas: (a) classroom organization; (b) practical skills; (c) factual knowledge; and (d) program planning. While all four areas needed immediate and serious consideration before the teaching assignment could be started, the writer chose to deal with the organizational problems of the physical aspects of the classroom first as they appeared to be the most obvious. Although classroom organization is a priority to some extent, in that a physically organized environment makes

teaching more effective, it does not necessarily have to come first in problem solving. The writer has separated her solutions to the problems into four categories and deals with each in sequential order for convenience sake. She is aware that much of the learning overlapped into all four areas simultaneously. Problems in one area certainly affected problems in other areas at the same time. Exploring the classroom environment proved to be a good mental introduction to the other work required in the practical, factual and planning areas. The knowledge and skill needed in the factual and practical aspects of ceramics were appropriate secondary areas to investigate as program planning, to a great extent, depended on the writer's abilities in these two areas. Finally, with some classroom organization and some basic factual and practical skills established, the program was developed. The initial program was basic in all respects and developed as the writer continued the process of discovery learning over the five year study.

The specific goals and objectives established in regard to classroom organization included: (a) becoming familiar with the function of all tools and equipment; (b) making certain that tools and equipment were in the best position and condition for effective use; (c) establishing a reliable clay recycling program; (d) ensuring that project storage areas were used efficiently; (e) containing poisonous chemicals in locked safety areas; (f) setting up display areas for two and three dimensional work; (g) ordering necessary supplies; (h) developing a consistent clay firing schedule; and (i) establishing clean-up routines.

The learning objectives in the practical skills area included: (a) developing handbuilding techniques; (b) mastering the throwing of pots

on the potter's wheel; (c) making glazes; and (d) acquiring a variety of methods for decorating clay surfaces.

More specific goals were needed in the factual knowledge area and included: (a) gaining a comprehension of clay's behaviour and limitations; (b) acquiring an understanding of glaze chemistry and toxicology; and (c) establishing a solid foundation in the history of both ancient and contemporary ceramic art.

The learning objectives and goals in developing and planning a ceramic program included: (a) establishing a philosophical basis and attitude for teaching ceramics in a secondary school; (b) defining course requirements; and (c) devising methods of evaluation.

The learning strategies and styles which a discovery learner isolates for use are highly personal due to the fact that we all learn in ways which are best suited to our abilities and personalities. The writer found information in a variety of areas which included both human and mediated resources. The human resources (teachers and others) incorporated both verbal and nonverbal exchanges with a variety of individuals involved in ceramic art. What is meant here by a nonverbal exchange can be exemplified by the type of learning gained from simply watching a ceramic artist at work on the wheel, decorating, and glazing. Teachers at all levels of ceramics from elementary schools to universities had something to offer either in conversations or in observations of them at work. Most educators in public school systems (human resources) were anxious to share any information available on teaching techniques and were eager to explore opportunities for dialogue regarding their own work. One simply had to ask for consultation time in order to receive some valuable assistance. Night school community

teachers, sharing the classroom were also a good source of information. Teachers of private evening classes as well as college professors were contacted for additional lessons or discussions. Another important human resource was the studio potter and the practising ceramic artist. Studio visits with established artists offered enlightening and inspiring experiences. Most artists welcomed an opportunity to share their artistic thoughts and products. Watching a professional artist at work can teach a student many aspects of the art which he/she may not be able to formulate questions about.

The salespeople in most ceramic supply stores were also an appropriate source of information. Most local salespeople have a sound knowledge of the uses of the equipment, tools, and materials which they sell. Many of them are also involved in the development of new glaze materials and are aware of any new products on the market. Local school boards often have specially trained personnel available for consultation in the art areas. The Vancouver School Board, in particular, offers several after school classes under the direction of the Professional Development Department for teachers of ceramics. There is, for example, a special workshop provided on firing different models of kilns found in Vancouver schools. Courses offered in various post-secondary and private institutions proved to be a useful source of information for the writer and were attended either in evening or summer sessions throughout the study. Courses do play an important role in the complete SDL approach in that some formal instruction is generally advisable. However, the SDL learner must approach the taking of courses based on: (a) the availability of the course needed, (b) the appropriate timing of the course, and (c) the entry ability level of the course. In other

words, an SDL learner can not depend too much on formal course offerings to provide the majority of information needed but should seek out courses whenever possible to complement the other resources being used. Finally, the writer learned from her students who came to class with previous knowledge or experience in ceramics.

The mediated sources of information were those which included magazines, books, films, galleries, museums, and specific television programs. Magazines which dealt strictly with ceramic art were interesting to read because they arrived on a consistent basis with both technical, timely, and aesthetic inspiration and ideas to offer. The variety of books on the subject of ceramic art was wide and diverse. The writer found any information needed from the most specific to the most general. Libraries and book stores provided a rich source of ceramic literature. There were some films available for teacher use from local colleges, school boards, and film libraries which gave information on both technical and cultural aspects of ceramic art. Museums were ideal places for examining collections of ancient ceramics while galleries were useful for observing new and contemporary works. Occasionally public television programs featured the ceramic art of a specific country or artist. Those shows were generally of a high standard of programming and worth watching.

Probably the writer's most widely used learning strategy or style involved observation and trial and error. A developed sense of visual awareness is essential for successful learning in the fine arts as the amount of quality information gained through observation is often done unconsciously. Observation of students, other teachers, and artists at work proved to be invaluable. Focusing visual attention on objects of

ceramic art, both old and new, on a daily basis enabled the writer to become familiar with essential aspects of ceramic art readily.

Trial and error behaviour is both unavoidable and valuable in most new learning situations. It is unavoidable because we all make mistakes when learning something new and valuable because once we have corrected mistakes we are able to go forward with some important information on which to base future decisions. The writer found this method of learning played a prominent role throughout her five year study but primarily in the beginning.

In trial and error behaviour, what at first appears to be random and undisciplined action is in fact an attempt by the learner to put some order into what is to be learned. J.S. Bruner (1961) (Pappas, 1970) believes we try to solve new problems by rearranging the difficulty into a form which we know how to deal with. In other words, successful problem solving behaviour is likely to be planned and based upon techniques and styles which have worked in the past with other situations. For instance, if one has skills in some forms of artistic media it is likely that one will have little difficulty transferring those or similar skills into a new medium. Also, once one has learned some basic considerations in program planning in one area, one can expect to transfer those fundamental ideas to a new program. The writer's past experiences in teaching other art courses formed a firm foundation for success in teaching a new course in ceramic art.

It is important to emphasize here that a major factor in the writer's success with SDL stemmed from the fact that she did have experience in teaching concepts and skills, preparing specific lessons, class control, discipline and motivation, and organizing material into

manageable units. Additionally, she had a solid foundation in some theoretical, aesthetical and practical aspects of fine arts. Ideally, learning a new area of study as well as dealing with all the problems of being a new teacher is a situation which would not happen often. If it did occur, however, the following six suggestions might be useful to teachers with minimal experience and training: (a) transfer as many applicable skills as possible from your area of competence to the new area and seek out analogous relationships; (b) adhere to a simple program which provides a basic foundation in concepts and skills and enrich and embellish only as your own knowledge expands; (c) seek assistance from all sources, including colleagues, in-service workshops, school board consultants, evening courses, post-secondary staff and students; (d) emphasize your abilities to motivate, encourage and inspire students in their image development; (e) practise skills whenever time permits; and (f) allow students to share in your own growth by working on the same projects which you have assigned to them (when time permits). Students react favourably to art teachers who show them their own challenges in regard to materials and image development.

Once general and specific goals had been established and learning styles and resources had been isolated and located, the writer tried to collect and validate evidence of the accomplishment of her objectives. The evidence included: (a) physical and photographic examples of her work and that of her students; (b) the efficient working of classroom routines and procedures; (c) the interest of students in ceramics; (d) the success of students' projection of ideas through ceramics; (e) the support and approval of the ceramic program by staff, students, and

administrators; and (f) the documentation in thesis form of the work done over the past five years.

Having defined a self-directed learning plan, the writer will now present a detailed account of how the plan was applied specifically to the areas of classroom organization; practical skills; factual knowledge; and program planning.

Chapter IV

APPLICATION OF SDL

CLASSROOM ORGANIZATION

Tools and Equipment

Organizing the classroom presented several major areas of concern. The writer will now define these areas and give specific examples of how problems were solved in learning about tools and equipment, operation of machinery, developing a clay recycling program, organizing storage facilities, maintaining display areas, ordering supplies, establishing clay firing schedules, and instigating clean-up routines.

In her preparation for teaching ceramics the writer began by finding out what tools, machinery and equipment were basic and essential to a ceramics studio. Checking her classroom for these appropriate pieces was the first effort of organization. All missing items were replaced or ordered. However, as the classroom had been recently redesigned to function specifically as a ceramics room most of the appropriate materials and machines were located in proper positions. There were, for example, suitable sized stools for working at the potter's wheel, damp and dry cupboards, bins for recycled clay, sinks with plugs and proper drainage facilities, canvas covered tables, trolleys for transporting projects, display areas, and a good ventilation system. (For a complete list see Appendix A.)

Machinery

Much of the machinery was easy to use, however, for safety reasons the writer did invite a colleague who had studied ceramics at the Department of Art Education, U.B.C. to demonstrate the proper use of the pugmill and kilns. The writer also attended a workshop on kiln operation offered through the Vancouver School Board. As well as workshop attendance the writer took advantage of the information available through the kiln maintenance personnel at the Vancouver School Board to solve various other kiln and firing problems.

Clay Recycling

Initially, the writer tried to do all the clay recycling unaided and found that not only was it an impossible task to keep up with, but it was not beneficial to the students. Students need to participate in this essential procedure in order to appreciate the full cycle of activities involved in ceramic art. The writer worked out a system of group participation in clay recycling (see Appendix B) which enabled everyone to share in the responsibility. At the beginning of every new course each student who had paid his/her fees was given a new box of clay for his/her personal use. Once the clay had been used, it was up to each student to recycle enough clay for his/her use. Many students enjoyed the process and we often ended up with a surplus of reconditioned clay. The writer also took advantage of the clay recycling service offered by the Vancouver School Board. The dried out, properly packaged clay which accumulated at the end of each semester was picked up and recycled free of charge.

Clay Storage

Because the school was a community one, the classroom storage areas and equipment had to be shared equitably so it was important to label and separate day school shelves and cupboards from night school. A lockable storage room was also available for containing poisonous chemicals which eliminated some potentially dangerous situations in the classroom.

Display

There were several bulletin boards and shelves in the classroom for display use. The bulletin boards were used to mount photographs and illustrations of various pots and sculptures as well as information on procedures and techniques. A large sheet of butcher paper was used as a vocabulary record. When a new term was introduced it was posted along with its definition on the sheet as a daily reminder of ceramic language. Various books on ceramic art as well as pamphlets and other magazines were available on a daily basis in the classroom.

The resource books which proved to be of primary benefit are: The technique of handbuilt pottery (Winterburn, 1969); Ceramics, a potter's handbook (Nelson, 1971); Making pottery without a wheel (Ball, 1965); Pottery on the wheel (Woody, 1975); Finding one's way with clay (Berensohn, 1972); and Getting into pots (Wettlaufer, 1976).

Students were encouraged to read ceramic material during any free time. Students were also encouraged to participate in putting together pottery displays and designing pertinent bulletin boards. The bulletin board displays, for instance, could relate ceramics to other art forms or could be sources of design inspiration for pots and sculptures.

Supplies

Every art teacher is responsible for ordering supplies in the fall for the next year's classes. This was one of the most difficult problems the writer encountered as she did not know how much clay would be used, which supplies would be used more often or which tools would need to be replaced. Some compromises had to be made throughout the beginning year but important missing materials were generally available for purchase at any time through the Vancouver School Board or local pottery suppliers. Missing or unavailable materials created a need for flexible and imaginative thinking in problem solving. Groups of students invented new uses for old tools and basic materials. For instance, if a chemical was missing from a glaze recipe, satisfactory substitutions were found or new recipes were tried and students made sponges for cleaning out bottoms of tall pots by tying small sponges to old paintbrush handles. In fact, a complete list of simple solutions for common problems was compiled and added to as new ideas appeared (see Appendix C). The writer also received help in ordering supplies from her two art colleagues in the school although neither was directly involved in ceramics. Any excess supplies which were ordered by mistake or were inherited from previous teachers were shared with other teachers in the area. Two other good sources of assistance in ordering supplies were ceramic books and school requisition lists from previous years. By examining past lists one can establish a general knowledge of materials which are frequently used and in what quantities they are ordered. Once the writer had established which cone temperature she would be firing to it was easy to find several recipes for glazes at that temperature. The recipes need several basic chemicals and some in larger quantities than

others. Of course, the budget allotment for each program also played an important part in how many and how expensive materials were able to be purchased. At the end of every semester students made or donated several pieces to the annual school pottery sale. The proceeds from the sale were put in the school pottery fund and were used when necessary to buy extra supplies and special equipment for the classroom.

Firing

Setting up a reliable firing schedule depended on the kinds and numbers of kilns available. The school had one large, one medium, and one small kiln. The large kiln was slow firing and was used for bisqueware. It was a top loading Cress electric kiln model LT-3K. The medium kiln fired quickly and was used for glazing. It was a top loading Amaco electric kiln model LT-2. The small kiln also fired quickly and was used for glazing test pieces in particular. It was a top loading Amaco electric kiln model LT-3. Each kiln was fired carefully and all firings and glaze results were recorded until the writer gained a sense of predictability regarding kiln behaviour. As well as reading about kilns, the writer learned to fire kilns properly through the earlier mentioned kiln workshop. Once realistic firing routines and guidelines were established, students were encouraged to participate in this part of the clay process (see Appendix D).

Clean-up Routines

Establishing clean-up routines for the ceramics room was based on the writer's knowledge of which methods worked well in other art classes. In general, all the rules which apply to any art classroom

clean-up situation apply to a ceramics classroom. Once the room was properly organized with labels on cupboards and specific places allotted for particular tools it was up to the writer and her students to maintain the order. The writer tried to set a personal example as well as remind students of their mutual responsibilities. A sense of pride in the class environment plus a respect for the work of others helped to foster positive results. In addition to each individual cleaning up on a daily basis, the entire group cleaned up on a monthly basis for one class period. Students were encouraged to take finished work home to share with their families and to allow space for new work to be produced.

The classroom routines and procedures did not remain fixed. If a better, more efficient process was learned the old routine was changed. For example, certain projects demanded more space or different handling than others. The organization of the room tried to reflect the life and vitality of the ongoing work of its students. The organization of the room tried to serve the needs of the students first.

Once the physical aspects of classroom were organized, the writer began to examine the practical skills which needed to be mastered. The practical skills are now presented.

PRACTICAL SKILLS

The practical skills involved four main areas: (a) handbuilding techniques; (b) wheel or throwing techniques; (c) glazing; and (d) various methods of enriching or decorating clay surfaces.

Handbuilding Techniques

The handbuilding techniques to be learned involved a variety of methods including: (a) pinch, (b) coil, (c) slab, (d) patch, (e) molds, and (f) combinations of all the techniques. The writer had previously experienced working with most of the methods needed for handbuilding and therefore needed only to refine the skills already acquired. The refinement was based mainly on practising building pots, sculptures, and other functional objects using all or some of the basic techniques. The writer set specific problems for herself to solve such as building a combination patch and coil pot of a specific height and width. Many of the techniques were found well illustrated in a variety of pottery books. The writer also attended a summer course in handwork at the Emily Carr School of Art which enabled her to share her working ideas and abilities with other students and afforded her the opportunity of watching other artists at work on handbuilt projects. College and university campuses were also visited during winter sessions in order for the writer to see work being done by art teachers and artists in training. Another important source of inspiration and example were the variety of pots in local pottery shops. The writer was able to examine and handle many pieces of work which were offered for sale by current ceramic artists. This type of close, firsthand inspection enabled the writer to learn by example.

Wheelwork Techniques

The skills needed to master the potter's wheel involved: (a) clay preparation; (b) centering; (c) pulling a cylinder; (d) shaping; (e) trimming; and (f) adding lids, spouts and handles. In order to learn

the basic throwing techniques the writer enrolled in private classes in the evening through a local pottery studio. The skills learned in the classes were then practised on a daily basis during lunch hours and after school until the techniques were perfected. The consistency and frequency of practise proved to be essential to progress in this area. After completing a basic course, the writer continued with her study in a course designed for intermediates. One must be able to develop a rhythm or flow of energy when learning to throw pots. As well as working in practise sessions, the writer also watched experts in the field. She invited other instructors and students of ceramic art to visit the classroom to demonstrate individual throwing styles and methods. Student teachers in art training at U.B.C., for instance, worked in the ceramics room during practicums and offered many useful suggestions on mastering the potter's wheel. Although throwing styles are very personal the writer found some rules applied to gaining success in this area. Those rules include having properly conditioned clay, being comfortable at the wheel and developing a unity with the clay. (For a complete list of rules see Appendix E.)

Glazing

The art of glazing was also based on experimentation and imitation. The writer learned the basics of dipping, painting, and spraying glazes in the private studio classes she attended. She kept records of glazes effects and results for every experiment tried. Some results, of course, were totally unpredicted and only served to illustrate how exciting and spontaneous the work in ceramics can be.

Surface Decoration

Learning to enrich or decorate clay surfaces involved trial and error and observation for the writer. Many books illustrated various methods and techniques for altering and embellishing pots or sculptures. The monthly art and ceramic magazines, in particular, featured new and different methods of clay surface treatment. The kind of serious playing that surrounded learning to decorate clay was one of the most interesting parts of the writer's SDL in ceramics. (For a complete list of methods tried see Appendix F.)

The practical skills learned developed slowly over the five year study. With experience and new knowledge the writer was able to be more creative and flexible with techniques and thus more competent to give assistance to students struggling to solve the technical aspects of problems in ceramics. Like all practical skills, the more often they were used the more polished and refined they became. Once the methods involved in handbuilding, wheelwork, glazing, and decorating were learned, practise appeared to be the most important aspect of gaining expertise in each area. As students in any art field we learn the practical skills best by doing them. One other aid in learning practical skills was the constructive criticism of experts. Often a skill can be improved by a very simple alteration of approach or technique which is offered by an observer. Starting from the simple and gradually working toward the complex was also beneficial. As each technique was attempted and perfected, the writer tried to impose a personal style of working which was comfortable and rewarding to her. Although developing a personal style was important, the writer also remained motivated and inspired by the examples of work done by outstanding artists. Trying to

imitate the shapes or surface enrichments of other artists provided a worthwhile learning challenge. Even after the writer felt confident in her abilities to execute certain techniques, she remained aware of the need to adapt, adjust, modify, and alter when necessary.

Although the writer in this study has separated the practical and factual knowledge gained into separate stages of learning, much of the factual knowledge was learned simultaneously with the practical skills. The writer will now examine the areas of factual knowledge.

FACTUAL KNOWLEDGE

In gaining competence in factual knowledge concerning ceramics, the writer focused her learning on these three areas: (a) the nature of clay, (b) glaze chemistry and toxicology, and (c) the history of ancient and contemporary ceramic art.

The Nature of Clay

Gaining an understanding of clay's behaviour and limitations was achieved in three main ways. The first was simply to play with the clay in an explorative manner to find out how it reacted to certain manipulations such as stretching, rolling, patting, pinching, imprinting, and bending. As there are many different kinds of clay including earthenware, stoneware, and porcelain each one was explored for its own individual characteristics. Some of these clays which were compatible were also used jointly for some projects. Various clays were also altered in colour by the addition of stains and oxides to provide more variety. The second source of information was teachers who gave demonstrations on how to prepare clay for use. The preparation of clay

from the dry powder to the moist state is usually not done in secondary schools but is important information for teachers to have. The preparation of moist clay for projects, however, is a skill used by all potters. This preparation involves a wedging and kneading of the clay to render it smoothly consistent and free of air bubbles. Although many textbooks illustrate these techniques, they are ones which are better learned by observing someone. Once the writer tried wedging and kneading, it was helpful to have a teacher to give advice on simple corrections to make in hand and body positions for better results. Watching a teacher throw pots on the wheel while deliberately abusing the clay was also valuable in that it gave some general expectations of how clay would behave if treated in a certain manner. For example, overwet clay will slump and become soggy while underwet clay will drag and stick to the hand. Teachers often showed, by example of collected pieces, such clay aspects as over or under fired clay, glaze defects such as blisters and pinholes, and various states such as greenware and bisqueware. Learning, for instance, that clay handles snap off easily in the greenware state and that bowls chip readily in the bisqueware state saved a number of small pieces from disaster.

In addition to teachers, local salespeople proved knowledgeable in clay behaviour and on many occasions gave advice on the kind of clay best suited to certain projects, or the best clay to buy for versatility. The third source of information was books and magazines. Although this source was rather limited it was important at times. For example, monthly ceramic magazines have columns on technical advice regarding clay and glazing which often solved a classroom clay problem.

Glaze Chemistry and Toxicology

Learning the facts regarding glaze chemistry and toxicology was and continues to be one of the writer's most challenging problems. Much of the information was gained through the various learning strategies used throughout the whole study. These involved talking to people, reading books, and trying by trial and error. The writer was aware of a course offered in learning the basics of glaze making but was unable to attend it. The intermediate level course in this area was to be considered for a future time. Many teachers are willing to lend recipes or formulae for glazes which had been successful for them but a true understanding of what glazes were, how the chemicals interacted, and how formulae could be adjusted was essential to have. This information was readily available in a number of books and required some concentrated reading. Simplifying the knowledge into basic terms for beginning students to understand helped to clarify the facts for the writer. (See Appendix G.) Test tiles were made and small batches of glazes were tested under various conditions. The results were recorded and collected for future reference. Teaching students how to use a gram scale, measure chemicals accurately, and mix glazes properly and safely also clarified methods for the writer. Very little appeared in the usual textbooks regarding the potential toxic changes of many chemicals used in glazing, so the writer researched this topic in libraries. Some articles were found which proved to be useful in that many chemicals were listed stating their potential harmful effects over periods of time. This information was important to have in order to ensure that the students worked in the safest environment possible. (For a guide to Health and Safety see Appendix H.) The chemicals which appeared so harmless could, in fact,

be dangerous if used carelessly. Many artists spend entire lifetimes studying glazing. Such study does, in fact, require constant consideration from the writer even after five years of work in ceramics.

Ceramic Art History

The largest area of knowledge missing for the beginning ceramics teacher was that of ceramic art history and contemporary ceramic art. As in the glazing process, this was not an area to be covered in a few years of study. It still continues to be an ongoing part of the writer's SDL in ceramics. The writer approached this part of her study by separating her learning into two areas. The first area was the history of ceramic art. The resources which proved to be the most helpful in studying past ceramic art included books, films, and visits to museums. Books were the most complete and accurate source and were easily borrowed from both public and university libraries. Although films dealing with art history do not usually isolate ceramic art for consideration, many include important ceramic styles or pieces pertinent to certain periods in the evolution of fine art. Museums and galleries often contain permanent pieces of ceramic art representative of particular cultures and times but do have visiting shows as well. There have been, for example, visiting shows which featured snuff bottles, soup tureens, and tea pots. The writer also gained some valuable knowledge regarding ceramic art from various fine arts courses which she attended during her undergraduate years. The courses which were of particular value included the history of renaissance art, a study of South American art and the history of modern art. All courses included some important information concerning sculpture and ceramic pots. Not only were the

techniques and methods of artists emphasized, but the importance and value of the pieces for the artists was examined. Artists from the beginning of recorded history have found ceramic art an essential medium for expressing ideas relating to religion and daily rituals. People of all races, cultures, and times have used ceramic symbols to give reality to ideas and feelings and much of our knowledge of past civilizations is available mainly through the preservation of ceramic dishes and artifacts. Another way in which the writer was able to study ancient ceramic art was provided by visits to private collectors. One collector, in particular, had some outstanding work from China gathered over many years. It is often difficult to know who the private collectors are but many ceramic artists and teachers have access to these collectors through personal friendships. A further important way to learn about ceramic art was to travel to other countries. Most countries collect and preserve examples of their cultural heritage and in many countries ceramic artists still practise in the same ways as their ancestors did. The writer had an opportunity to visit a small pottery in Mexico during her five year study and was amazed to see the beautiful results of very old pottery making techniques. Having students become interested in particular ceramic styles was also used as a means of study for the writer. Research papers were shared with the classes and illustrations were displayed for discussion.

To learn about contemporary ceramic art the writer relied on books, magazines, local pottery stores, galleries, and colleges. Books and magazines provided an excellent, regular format for study as each was concerned with the most recent developments in ceramic technique and style. Local pottery stores and galleries were also visited on a

regular basis in order for the writer to be exposed to the most current work available. Colleges and universities were interesting to visit because the writer was able to see work in progress as well as the finished pieces done by students in their graduating shows. Some of the students agreed to visit the school to give demonstrations on techniques and discussions on their work. One show of particular interest was given by a student involved in making ceramic buildings which were replicas of famous cathedrals and other temples of worship. All of the teachers in training in ceramics also brought examples of their work from the Art Education Department at U.B.C. during their practica. There were annual invitational pottery shows sponsored by various artists from British Columbia which provided another interesting source for study. The writer did not enter any pieces of her own work in these annual shows but did try an experiment in producing and selling her work during one summer of the five year study. The reason for having this experience was based on a curiosity about how marketing in ceramics is done. Some students in secondary schools today are concerned with future employment and are anxious to know about the possibilities of being employed in the ceramic art field. To gain some knowledge firsthand the writer made some pieces of pop art ceramic jewellery and proceeded to market the pieces in local stores. The study involved examining the cost of materials, the time and labour involved in producing and selling, and the profits made. It was a rewarding activity in that there is a satisfaction in seeing one's own work appreciated by others, and it was a substantial introduction to marketing. The writer found the scheme needed to be refined and streamlined considerably before any profitable employment for students could be

found in this area. Working on a small scale as an individual artist proved to be difficult in terms of monetary success. Some graduating students, however, were anxious to try this adventure for themselves and planned to try a similar project at a later time.

Acquiring factual knowledge in ceramic art is one of the most rewarding aspects of an individual's involvement in the field. Because there is so much to learn from the past and because many new ideas are still being presented ceramics is a source of continuing stimulation, both mentally and physically.

The writer planned much of the first clay program based on her own skills and knowledge at the time. The main reasons for success of the beginning program were based on the writer's past experience with art program planning and teaching. Although the information and skills she had were initially very basic, they were adequate to provide the essentials of a good program. The methods of program planning which were used are now presented.

PROGRAM PLANNING

The problems involved in planning a ceramics program are similar to those in planning any other art program. The teacher, once having established a philosophical basis for teaching the course in the first place, must then address the following issues: (a) what information is important to learn, (b) what assignments are appropriate for the interest and skill level of each class and individuals in the class, (c) what is the most beneficial order or sequence of learning, (d) what value can the student receive in terms of enjoyment, developing personal imagery and knowledge from each lesson, and (e) what terms of evaluation

are most appropriate and beneficial to both student, parent, and teacher?

In deciding what information was important to them the writer made the assumption that most students would know very little about clay and would therefore need to first understand its composition, preparation and processes. (For a complete list of the clay process from start to finish, see Appendix I.) Students then learned the basic skills involved in handbuilding, including pinch, coil, mold, slab, and patch techniques. With a good foundation in clay behaviour learned through handbuilding students proceeded to learn wheelwork skills including centering, pulling a cylinder, shaping, trimming, and finishing pots. The decorating and enriching skills were learned simultaneously as the need to alter clay surfaces arose. The use of tools and equipment was also taught as the need for them appeared necessary. Ceramic art history and appreciation was taught indirectly for the majority of the time as part of introductions to or motivations for specific lessons. Intermediate level students were, however, expected to present a written research paper on some aspect of ceramic art as well as a written review of a personal visit to a gallery exhibiting ceramic art.

Establishing what kinds of assignments would teach the skills and attitudes desired, plus be of interest to students, was based on the writer's past experiences in lesson planning for other kinds of fine arts programs and on trial and error behaviour. In general, once the handbuilding skill to be taught was isolated the writer tried to find the most stimulating and rewarding presentation of the idea to challenge and motivate her students. For example, pinching pots in clay is not particularly exciting for many grade nine students as they seem to feel

the end results are not worth the effort. Discussing Japanese tea bowls and pinching pots for this purpose seemed to help. Also, inlaying other coloured clays to change the surface pattern proved to be of interest. Once two identical pinch pots were made and joined, the use of pinch pots was expanded. Making a bird whistle from the joined pinch pots was another lesson which elevated the pinch pot in the estimation of beginning students. Each student was encouraged to make his or her whistle as unique and interesting in shape and design as possible. The size of the bird body and the number of holes controlled the tones made. Several students made more than one size of bird and experimented later in small groups with playing simple tunes. Students were inspired to try to make other kinds of simple musical instruments from clay, including flutes, oricanas, and drums. Small miniature thrown bottles were also altered into simple whistles. Some discussion arose of countries, such as Mexico and Peru, which historically have used clay to make small whistle toys. Students were encouraged to pursue further investigation of ceramic objects indigenous to South American countries.

The writer tried to incorporate the natural interests and concerns of students at particular age levels into the clay problems presented. For instance, an intense concern for relationships, physical appearance and social concerns were the basis for some lessons. Students might be asked to do a sculpture illustrating a relationship such as mother and child, the friends, or the quarrel. Pieces of work involving athletes, dancers, or acrobats demonstrated an interest in the human form. Life-sized bodies or realistic self-portraits were constructed to explore the human form on a different scale. Social concerns such as isolation, ecology, world hunger, poverty, endangered species, threat of

war, ageing, and dying were also expressed through clay pieces. The interest in puzzles or interlocking patterns was explored through making original cartoon figures in clay and then cutting the figure into pieces of a jigsaw. One assignment required a sculpture consisting of five or more pieces based on a family of shapes which could be separated into individual forms or could be interlocked into one form. Art history and appreciation was also included in assignments through various means. One assignment challenged the students to learn through the imitation of a style or type of work from a past culture. Surrealism and an interest in the absurd appealed to most secondary students. Making an everyday object in either minimum or maximum size proved to be of great interest. Making a sculpture which put two unlikely elements together, such as a nonfood item on a dinner plate, was one student's example of the absurd. Making fantasy shoes such as a pyramid, or a cat shape, was also a popular surrealistic assignment. Pop art and its humourous implications was enthusiastically explored in sculpture forms. Another lesson which emphasized humour or wit was to make a soup tureen which was unusual. Students made a great variety including a queen tureen, a whale of a tureen, a garbage can tureen, and a turnip tureen. Students were also interested in generally pleasing design forms. One assignment was to build a pot based on an organic shape or form such as a shell, stone, or vegetable. The form was to be simple, elegant and refined. As well as sculptures which expressed emotions and personal philosophies, students were challenged to make well constructed and designed hand made functional objects such as mirror frames, trivets, wall plaques, and containers. Some assignments were based on notebook exercises. (See Appendix J.) Many lessons were based on what students said they were

interested in learning. All lessons were subject to modification, adaptation, alteration, and elimination, depending on how they were received by students and how much students learned from doing them. The lessons were designed as much as possible so that the less able student could handle the problem while the more able student would not be bored by it.

The order of learning was based essentially on starting with the most simple and basic skills and gradually adding the more complicated and complex skills. For example, most students spent some time in handbuilding and exploring clay's limitations before starting to work on the potter's wheel. Once a sense of clay behaviour was established, students worked alternately one week on handwork and the other on wheelwork. Teaching how to throw on the potter's wheel was based mainly on how the writer learned to throw, although there are many throwing styles available to emulate.

The writer learned to throw by taking a beginner's pottery course at a private studio. The course consisted of ten basic lessons on kneading, centering, throwing a cylinder, altering cylinders, trimming, and glazing. The writer also used books with illustrations on throwing and practised different techniques daily for the first year of teaching ceramics. A valuable source of information on throwing was provided by the night school instructor. He offered criticism and advice on the technical aspects of throwing as well as demonstrating effective ways of throwing. After the first two years of teaching ceramics the writer enrolled in an intermediate level throwing course offered by the same private studio. She also benefited from a ceramics summer school course offered by the Emily Carr School of Art, which included throwing and

handbuilding methods. While lessons helped, the most consistent method for learning was daily practise. The writer challenged herself to making a variety of shapes and sizes of pots until she could make most shapes easily and predictably. The writer isolated some basic rules for throwing which seemed to help beginning potters. Once the students had mastered cylinders they were able to alter pot shapes enough to make other forms including bowls, plates and tea pots. Both the handbuilding and wheelwork course requirements were divided into two separate areas which included one for basic beginners and one for intermediate to advanced students (see Appendices K and L). At times, unavoidably, there are both beginning and experienced students in the same class so course requirements are different for various students in the same room.

Evaluation

Deciding the value of each lesson in terms of student skill and knowledge, image development and enjoyment was handled by the writer in consultation with her students in most cases. The manners in which these issues were explored depended upon different forms of evaluation. Before beginning a description of different forms of evaluation, however, the writer will characterize the nature of evaluation.

Evaluating children's art involves making some judgements about a child's growth or progress based on some planned goals or aims. Because of the nature of art, art processes and outcomes, and children evaluation provides the art teacher with some difficulties. E.W. Eisner (1966) writes that art, unlike most subject areas, does not have as uniquely stable, consistent or predictable objectives upon which to base judgements regarding educational behaviour as do other subjects. For

example, mathematics or science courses have clearly defined tools such as tests which are designed to measure knowledge of specific facts, procedures, formulae, or problem solutions. It is important to note here that although Eisner was speaking about children, it is reasonable to apply his ideas to the problems of evaluation at the secondary or adolescent level. Eisner (1966) believes that it is very difficult to control the type of learning which may develop during the art process. He does agree, however, that art teachers must be clear about their purposes for teaching any art lesson (pp. 384-388). Kenneth M. Lansing (1976) has identified similar concerns regarding art evaluation. He believes that teachers must first establish some standards or expectations of artistic ability levels for the majority of children at particular grades. He further suggests that the areas of skills, attitudes and knowledge be of prime consideration when establishing goals in art education. Lansing (1976) points out some difficulties in evaluating children's art growth even after goals are developed when he says that children may not make equal progress in each area simultaneously. For instance, a student may be very knowledgeable about art history but very poor in technical skills (pp. 532-544). Both Lansing (1976) and Eisner (1966) are concerned with evaluating children's art on the basis of particular educational objectives. Eisner (1966), however, applies a further condition to evaluation when he suggests that less emphasis be put upon one child's art processes and products in comparison to another's. He sympathizes with the fact that students and their parents want to know how they stand in comparison to their age group, but maintains that the only meaningful assessment of artistic growth

comes from comparing one's own past abilities with one's present abilities.

Once teachers are aware of some of the difficulties in planning what children will learn from a specific lesson, they also become aware of the difficulties inherent in evaluating art growth. Art teachers must, to some extent, be prepared to evaluate educational behaviour based upon unique and particular circumstances for each student. At the same time, however, each teacher generally has an overall point of view on evaluation and a series of specific criteria which can be applied to most lessons. The writer believes that evaluation of students' progress and growth in any art class is best handled in a variety of ways. Ideally the procedure should involve exchanges between student and teacher during the entire working process and not only at the end of an assigned project. The terms of evaluation should be clearly explained to and understood by students at the onset of any lesson. The teacher and student should, however, maintain a certain sense of flexibility in regard to evaluation, as what is learned by a student may not always turn out to be what the teacher and/or student planned for the student to learn. Teachers must be prepared to give credit for new and original outcomes of specific lessons. Students deserve and need to know the criteria which will be used in evaluating their work, and also how much emphasis will be placed on each area. For example, some lessons may stress technical ability over creative problem solving such as when one tries to master throwing a cylinder on the wheel. Most lessons will ideally involve a variety of areas of teacher concern such as student interest, effort, expressiveness, originality, skill level, knowledge of art, ability to solve visual problems, participation in class routines

and discussions, receptiveness to criticism, respect for others' work and environment, and co-operation. More specific influences on evaluation may involve such issues as punctuality, completion of work, extended effort and interest, conscientious attitude, and the ability to think independently. The process is a complex and often complicated one which involves much communication between teacher and student. Many students can become overly concerned with the mark they are going to receive on any given project. It is important to arrive at some kind of balance of importance in this area as we do want students to be as concerned about their art processes as they are about their art products. It is our role as teachers to help students to appreciate the cultural and humanistic enrichment of their lives which is often gained through the study and making of art. This appreciation can often help in keeping marks and grades in some reasonable perspective.

Up to this point, many of the comments made have been oriented toward teacher based evaluation. We all want to know when we have succeeded in the estimation of our teachers, but we should also want to know when we have succeeded in our own estimation. To be able to judge one's own progress and growth is more difficult than to be evaluated by someone else. Many of us do not have the natural or learned skills to be able to accurately assess ourselves. To encourage students to be able to make self-evaluations and therefore be more responsible for their own learning, several ideas can be tried. One idea that students seem to like and are able to handle without too much difficulty is the completing of a self-evaluation form for each project which is completed (see Appendix M). Not only do students benefit by taking some part in their own grading but they also tend to have a clearer picture of what

criteria evaluations are often based on. Their participation helps them to understand that evaluation is concerned with the success or failure of the work and is not only concerned with the personality of the student. The writer is aware that all art forms are concerned with the personality of the student. However, some students are concerned that marks teachers give have something to do with how much the teacher likes or dislikes the student. With self-evaluation included as part of the final mark given, these misconceptions can often be cleared up. Another source of evaluation can be found in the classroom critique session where all students participate in a viewing and discussion of one another's work. Unless students are practised in or initially guided through this kind of group dialogue, many critiques can be unsuccessful. Even though the critique process gives students an opportunity to express verbally some ideas about what they see, many have distinct difficulties saying exactly what they mean. This is possibly due to the fact that many of them have not been required to do this kind of criticism or analyzing before. These skills can, however, be taught and developed over a period of time and experience. It seems to be a worthwhile type of activity to pursue from the point of view that we all want to feel some respect and admiration for our work from our peer group. High school students will generally not talk too much about their own successes voluntarily for fear of being labelled conceited or immodest, so it is important to have a legitimate arena for this kind of self-oriented discussion.

During any evaluation, whichever form it takes, it is important to remember that the main objective should be to find ways to help the student to improve and excel rather than to point out failures. It is

also essential to help the student to maintain the motivation and self-confidence needed to continue on to the next area of study and to help to prepare him/her to meet the challenge of solving a new set of problems.

To establish a fair and complete method of student evaluation it is important to have both student and teacher involved jointly throughout the entire marking period. The evaluations can and should take several forms, including discussions and written techniques including tests and research papers.

All art programs, like evaluations, are somewhat unique in that they are based to a great extent upon the teacher's experience, training, preconceptions, and philosophies. The B.C. curriculum guide, for example, is currently being revised and in its newer form could offer a more comprehensive source of guidance than was available in the recent past. Teachers will no doubt alter and improve current programs based on their acquisition of information on new School Board policies and on their own improved strengths and abilities. The writer's first program in ceramics changed considerably over the five year study mainly due to her new abilities and it continues to change annually. The type of program changes which occurred are now examined.

Chapter V

EVOLUTION OF THE PROGRAM

The program changed quickly and dramatically in some ways at a very early stage, and changed slowly and subtly in other ways at later stages in the five year study. As the writer gained more skills and knowledge she was able to change the lessons from basic to more complex, and was able to add more specifics to the general information she had learned. For example, many of the first lessons planned relied heavily on handbuilding as the writer's throwing skills and knowledge were weak. However, once she had mastered throwing on the wheel she was able to add this dimension to the program. The first lessons were also prescriptive in nature and became more open-ended as the writer's confidence grew. Knowledge allowed the writer to be more flexible in lesson planning and to encourage exploration and experimentation. More teacher confidence allowed for a better acceptance of the validity and significance of students' ideas. The early lessons were replaced by ones which allowed for more consideration of students' individual differences, needs, and interests. The beginning lessons often did not challenge all levels of students in that many times the lessons were too difficult for the less able students and too easy for the more able ones. With time the program became less reliant upon teacher-directed projects and more open to student input. Projects or end results eventually became a more balanced part of the program in that ideas rather than skills and techniques were emphasized. The writer was able to help students develop a sense of personal imagery in clay once her own concerns

regarding technique were alleviated. In other words, what students wanted to say in clay became more important than how they would say it. The more knowledge the writer gained in techniques involving building, throwing, and glazing the more able she was to provide a variety of sources and resources for her students. The first programs were very limited in the glazes, tools, and materials which can enrich a ceramics art experience. Although many outstanding results can be achieved through meagre equipment, having the appropriate tools often makes the working process more enjoyable and rewarding. With more skills and knowledge the writer offered a more professional program which encouraged students to not only use appropriate techniques but also to apply pertinent terms and vocabulary. As the writer's abilities grew she became more personally interested in and committed to the study of ceramic art. This interest was reflected in a greater enthusiasm for teaching the subject and a desire to personally learn more about the area. Teacher enthusiasm can often play a major role in motivating the secondary student. With a solid background in ceramic facts and information the writer was able to better guide students toward discussions of ceramic art history and appreciation during class working sessions. Usually students will focus the major part of their classroom conversations on personal social concerns but with some interesting stimuli such as films, papers, or photographs to discuss the situation can be turned into a forum for an exchange of ideas about art. In the beginning programs students were required to do very little research or writing about ceramic art as the emphasis was on processes. This changed as research into ceramic art history became part of the course requirements. The early programs also used very few visual aids, but

the writer gradually acquired a valuable collection of photographs, articles, and films which could be recalled and produced quickly to illustrate ideas or techniques. The visual aids often helped to solve problems more quickly, easily and positively. As well as being able to plan a better, more flexible program the writer eventually was more able to evaluate the results of the learning. Experience allowed the writer to recognize and appreciate a piece of work which was novel, original and unexpected. She was better at understanding student frustrations and problems and was thus more appreciative of efforts rather than end products and the efforts were more realistically evaluated, based on a knowledge of what abilities were appropriate for certain age levels. The evaluations of student work were more student and teacher based rather than just teacher based. The writer became more capable of directing class critiques and more able to help students with concept formation, identification of styles, and stating reasons for preferences. Skills in analyzing, comparing, and generalizing became easier to teach as the program developed. As the writer became more expert in the areas of skills and knowledge, her attitude and ability toward program planning improved. The lessons became more suitable to the age and interest of the students as well as more directed toward image development rather than just skill development. For example, in early projects students were often required to coil pots in a particular technique rather than allowing for combination or inventive techniques. The writer was aware that one coiling method worked and wanted students to be guaranteed a successful end product rather than encouraging them to find out for themselves about other ways of approaching the problem. Later projects were based more on individual interests and students were

encouraged to bring in their own ideas for work they wanted to do. For instance, themes involving humour, surrealism, fantasy, science fiction, and mystery were introduced by students more often than by the writer. The writer's early program slant tended more toward a design and craft orientation rather than an expressive one. This continues to be an area of ongoing concern in her present program plans and changes. The lessons also became more interesting because of all the techniques available and because of more student input in all areas. Both the writer and her students were better able to evaluate the program and their participation in it with time and experience.

In the preceding chapters the writer has attempted to define a SDL plan for ceramics and illustrate how it was applied to the initial problem areas of class organization, practical skills, factual skills, and program planning. As programs change and grow from year to year, some of the main changes have also been included. The writer would like to now conclude in the final chapter with a summary of her findings as well as suggestions and advice for other teachers.

Chapter VI

SUMMARY

The writer's aim in this study was to bring attention to the emerging problem of retraining faced by many teachers throughout their careers and to offer ideas based on one possible solution to the situation. The need to retrain often arises because of the introduction of new course material into the curriculum. Currently, an additional cause is the declining school population in many major cities in Canada and the United States. The predictions seem to indicate a continuing trend toward smaller school enrollments and, as a consequence, such teachers' retraining needs will persist for some time. Additionally, teachers will be required to teach new and more relevant materials in order to prepare tomorrow's students for quality lives in the coming years. For example, courses which specifically deal with consumer oriented or computer-related data will probably be in great demand. It is highly likely that all teachers everywhere to some extent will experience changes in the courses which they are required to teach. In an attempt to offer some solution to this problem, the writer has presented a personal case history of her own retraining problem and has illustrated how a self-directed learning (SDL) plan was devised and applied to the area of ceramics. SDL is, of course, only one approach. Another solution might be developed through obtaining an educational leave or study. Study leaves, however, must be planned and often do not fit into the time allotted for the retraining to take place. SDL is a

continuing process and is influenced by, and can be adapted to, the individual teacher's time, energy and needs.

The writer is aware that SDL as a solution to retraining is not entirely ideal, as students have to put up with the teacher's gradual growth. For example, during the writer's first year of teaching the ceramics program, one student, in particular, had advanced skills and knowledge in the area. This student provided the writer with much needed information. The writer challenged this student to grow in other areas such as leadership (assisting new students), image development, and aesthetic awareness. This student graduated from the school the following year and obtained employment in a pottery studio where she was responsible for firing kilns, preparing glazes, and teaching basic skills. The writer feels that this student was able to handle such a job because of her exposure to similar responsibilities during the year she studied with the writer. The writer's advice to teachers attempting to learn through an SDL method is to be concerned with attitudes and planning.

Attitudes are important because they determine to a great extent how successful the SDL learner will be. To see the retraining situation as a challenge rather than a problem is a good example of the positive, flexible thinking needed. To be resourceful enough to apply past abilities, knowledge and experiences appropriately to present situations is also beneficial.

Planning is fundamental to successful SDL learning. SDL plans should be conducted in much the same manner as a scientific inquiry is. Teachers who pay attention to attitudes and planning will have few problems devising a personal SDL plan.

PROPOSAL APPLICATION OF SDL

Although the specific area of consideration in this study has been ceramics, the writer would now like to illustrate in two steps how this model of a SDL plan could be applied and adapted to the needs of others. For example, how could this approach be used by an art teacher who had no experience in photography but must teach a photography course at the secondary level? First, a review of the main characteristics of the SDL plan will be presented. Second, the SDL plan will be specifically applied to the learning of photography aimed at preparing the inexperienced teacher to becoming competent in this particular area.

Initially, the following five questions must be addressed by the SDL learner: (a) what skills, knowledge (historical, cultural, and aesthetic), and other information are needed both in general and specific terms, (b) how will this information be learned, or which learning styles will be used, (c) how will the content or material to be learned be organized into logical, sequential patterns, (d) which sources and resources can be used, and (e) how will the learner evaluate his/her growth and validate the accomplishment of objectives?

Ideally, the inexperienced teacher would undertake to use the five SDL questions in sequential order to facilitate the learning process. Assuming that the first question would be dealt with first, the teacher could refer to books and speak to colleagues teaching photography or professionals in the field in order to establish in general, and later in specific terms, what material would be fundamental to learn. The general areas of consideration would appear to fall into the following four categories: (a) classroom organization, (b) practical skills, (c) factual knowledge, and (d) program planning. Once general goals are

established more specific goals for each area are required. To ascertain which specific goals are needed in each of the four main categories the teacher must refer in a detailed manner to books, colleagues, post-secondary instructors, or any other source of information available. Initially, some specific goals may be overlooked but as the SDL learner becomes more knowledgeable in the area of study, other important previously overlooked goals will become evident. To illustrate the point that specific information must be understood in each of the general areas of classroom organization, practical skills, factual knowledge, and program planning, the writer will now outline important issues of concern for photography beginning with classroom organization.

Classroom Organization

The teacher must have knowledge of the following: (a) tools (cameras, lenses, tripods), (b) machines and equipment (copy stand, lighting kit, quartz lights, back-drop system), (c) materials (films, chemicals), (d) darkroom physical requirements (small, light-free room, hot and cold water, sink like table, non-vibrating table, electricity), (e) darkroom operation equipment (safelight, timer, enlarger, film cassette opener, scissors, film developing tank with spools, funnels, tongs, thermometer, dust brushes, trays, clips and drying line, paper storage box), (f) display (matte board, X-acto knives, spray adhesive, matte cutter, dry mount press, paper cutter, display boards), (g) ordering supplies (school board requisition, private supplier), (h) storing chemicals (plastic jugs, safety metal cabinets), and (i) room maintenance (a system of orderly procedures and routines must be established).

Practical Skills

After ascertaining what equipment and supplies are needed to operate a photography classroom, the SDL learner must have knowledge of the practical skills involved. The following are essential: (a) use of cameras (optical theory, lens function, shutter operation, aperture, shutter speed, variations of use), (b) film developing (chemical reactions, film emulsions, temperature and timing, agitation, drying), (c) special effects on film (posterization, contrast, grain, reticulation, sandwiching), and (d) special effects in printing (burning, dodging, solarization, posterization, contrast, grain, paper types, cut and paste, tinting).

Factual Knowledge

The SDL learner must have factual as well as practical knowledge in photography. The factual areas of concern include the following: (a) historic aspects (development of the camera, developments in photographic use from portraiture to advertising, photography and art), (b) cultural aspects (comparative attitudes toward photography through time, documentation of domestic and foreign cultures, photography as a twentieth century art form), and (c) aesthetic aspects (fundamental composition, design principles, control of film and camera for desired effects, manipulation of subject material).

Program Planning

Once a degree of understanding and ability has been established the SDL learner can begin to plan a program in photography. The program would be basic to begin with and become more complete and complex as the

teacher's competency grew. Beginning course requirements might include the following: (a) successful manipulation of the camera, (b) successful development of a black and white film, (c) successful demonstration of some printing techniques, (d) a photographic study based on a theme, and (e) a written review of a gallery show or a famous photographer's style. The beginning teacher might rely heavily upon critical discussions of photographs, film presentations, slide presentations, guest artists and speakers, gallery visits, books and magazines, and other media in order to accommodate his or her own learning simultaneously with that of the students in class. Finding out what the specific goals are for each general area from classroom organization to program planning is the major planning effort involved in SDL. To know what one must learn has to come before any learning can begin. The writer has included this detailed plan of an approach to learning photography as an example of how she approached the specific goals she needed to learn in ceramics in the same manner.

After establishing specific goals, the SDL learner will then have to decide how the various skills and facts will be learned. To a great extent, the kinds of learning styles which a person is successful with depend upon past experiences both in educational institutions or on one's own. For example, we generally have four choices of learning: (a) by lecture, (b) by demonstration, (c) by actually doing something physically, and (d) by reading. Most people have a method or a combination of methods by which they personally learn best. The writer's advice to SDL learners is to be aware of one's own style and use it most often whenever possible. However, some aspects of the learning of photography demand certain kinds of learning. For instance, it would be

difficult to totally understand the working of the camera and what effects one can achieve without actually using one. On the other hand, one could probably gain an aesthetic appreciation for photography in a number of ways, including looking at the work of others, reading specialty camera art magazines or attending gallery shows. As in most learning, which involves a diversified content of material, the learning of photography would demand the use of many learning styles.

Organizing the material to be learned into logical patterns is often determined by what has to be learned. Also, much learning overlaps from one area into another. It would seem logical, however, to begin by organizing the physical environment which would help the learner to familiarize him/herself with the materials he or she will have to work with. A natural progression from taking photographs and experimenting with the camera is to develop the film, enlarge the prints, correct the flaws, and display the finished work for visual sharing and constructive criticism. In other words, much of the order of the learning is designed for the learner by the nature of the material. In addition, an inexperienced person usually begins with simple concepts and operations before advancing to more sophisticated thinking and complex techniques.

Establishing which sources and resources to use depends upon which people, places and materials are available to the learner. In ideal situations, the SDL learner could contact another secondary level teacher of photography, professionals in the field or post-secondary instructors. A photography club might provide some valuable discussion from other amateurs interested in learning more about photography. Lessons or classes are usually available from vocational, fine art or

other post-secondary institutions. Private studio or community night school classes could be considered. Local libraries, museums and galleries provide examples of the work of established and new photographers as well as information on all the various aspects of photography required by the student of photography. There is also a wide selection of magazines and self-help books available on this subject. As in the case of learning styles, the resources an SDL learner uses are highly personal and best suited to his or her individual requirements.

Once the specific information needed has been established, the learning styles have been selected, the order of learning has been planned, and the resources have been isolated, then the SDL learner must begin to master the skills needed in order to teach. This mastery will take time and practise. As the SDL learner progresses, some changes in his or her abilities will be obvious but the SDL learner has the responsibility of consciously evaluating his or her growth on a consistent and reliable basis. If one is entrusted to teach a quality program to secondary students, then one must be accountable for the nature and standards of the program being taught. Therefore, the SDL learner as teacher must devise tests to validate the accomplishment of his or her objectives. These tests might include a variety of types. The SDL learner could maintain a photographic record of beginning work to compare with most recent work. Constructive criticism and discussions with colleagues and administrators could provide an appropriate evaluation of the program. Student interests and growing abilities could indicate the successful application of the program. The most accurate assessment of growth and progress would be based on a combination of methods.

The writer's conclusions or findings from having been engaged in a five year SDL study concern attitudes toward learning as it applies to herself and to her students.

The writer found that SDL was personally very satisfying and will be used again for future learning situations. The writer feels fortunate that her past educational experiences prepared her so well for SDL. Because teachers are role models for students, and because adolescents are constantly experimenting with various imitations of adult behaviour, the writer has also realized how many of her SDL techniques and attitudes can be absorbed by secondary students. Teachers involved in SDL illustrate to students that education should be a lifelong process for everyone and should not end because one has finished a particular course of study or has graduated from an educational institution. Good teachers give students all the facts and information needed. Excellent teachers give facts, information and the desire to learn more on one's own. The writer's experiences with SDL will continue to influence the kind of program planned and the type of learning in which her students are engaged. Program planning will be based more upon students participating in the process and students will be encouraged to be more self-directing in all areas of their education.

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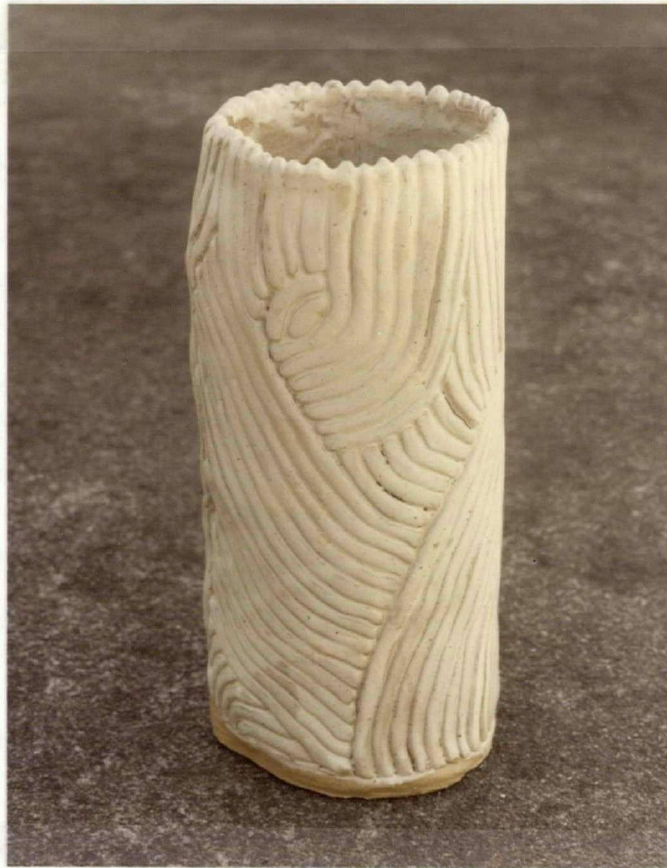


FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4



FIGURE 5



FIGURE 6



FIGURE 7



FIGURE 8

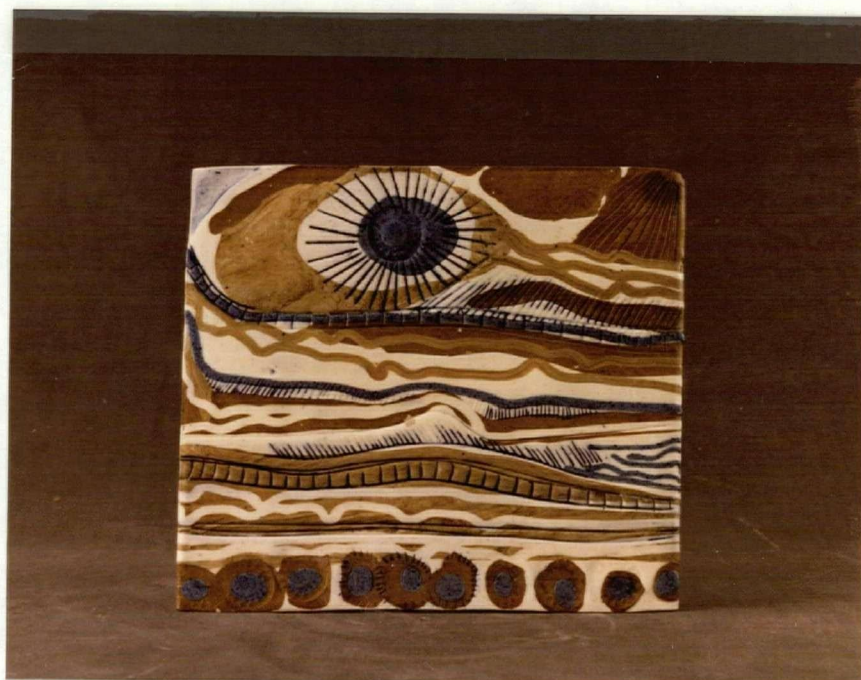


FIGURE 9

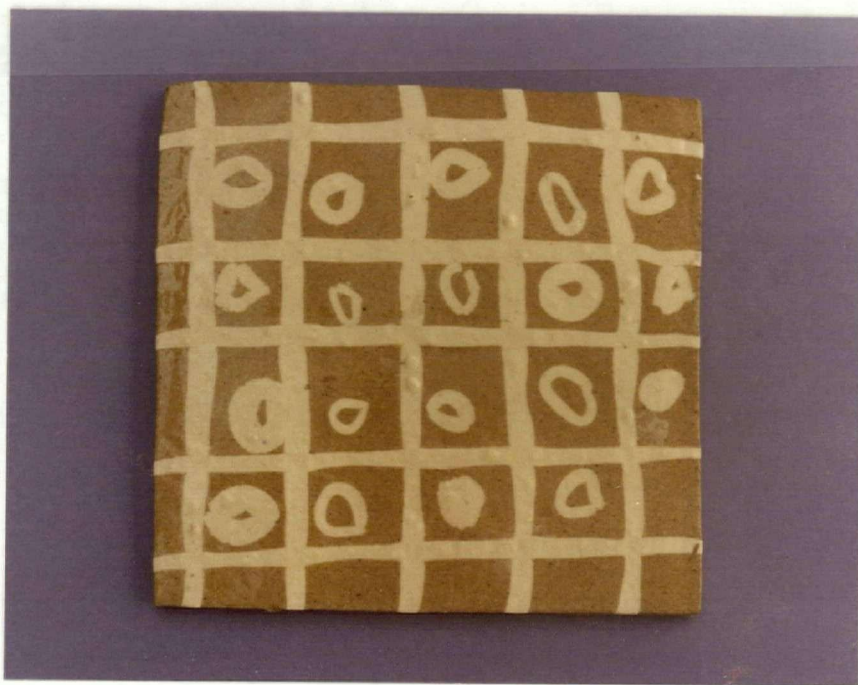


FIGURE 10



FIGURE 11



FIGURE 12



FIGURE 13



FIGURE 14

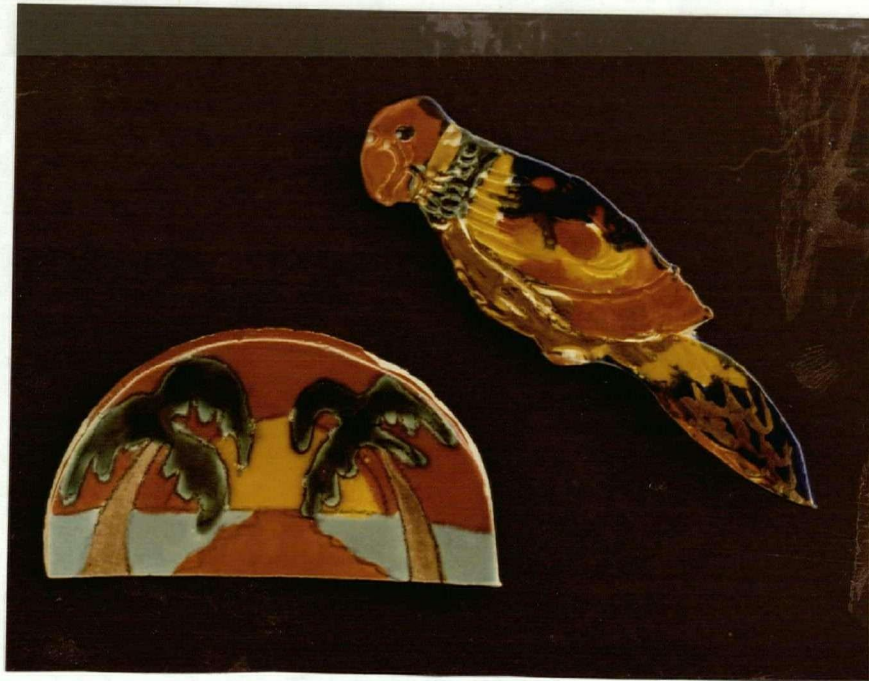


FIGURE 15



FIGURE 16

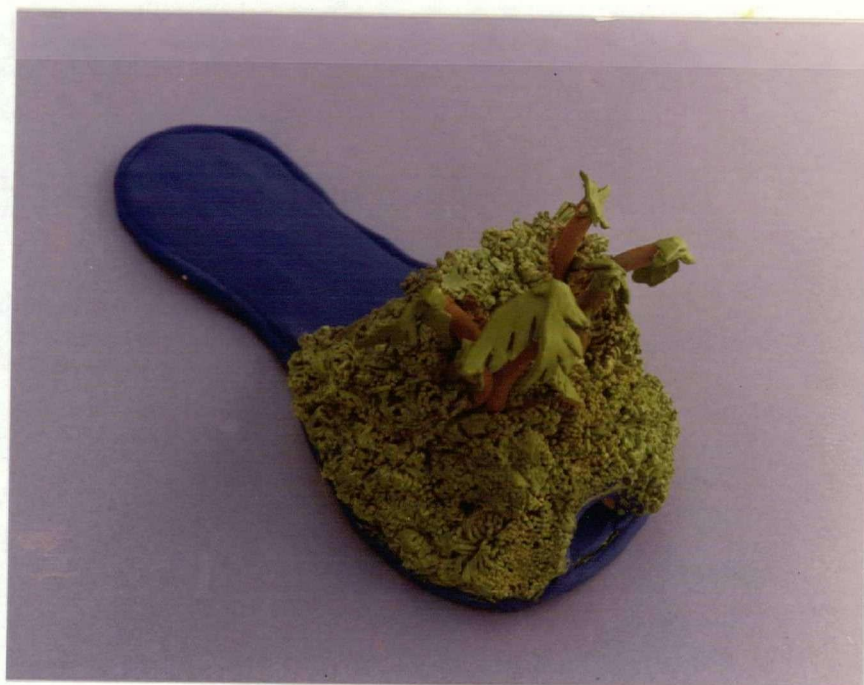


FIGURE 17



FIGURE 18



FIGURE 19



FIGURE 20



FIGURE 21

FIGURE 22

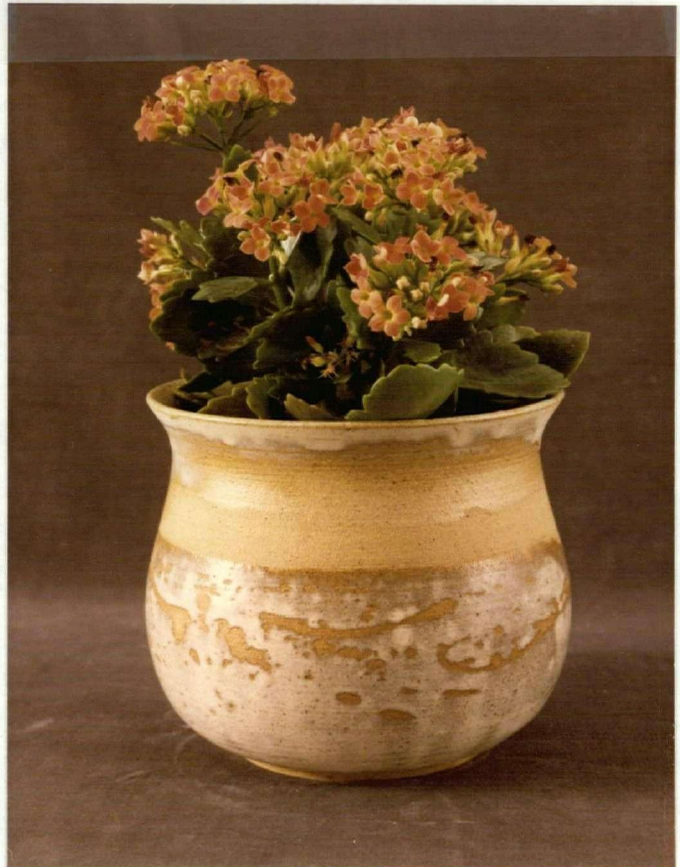




FIGURE 23



FIGURE 24

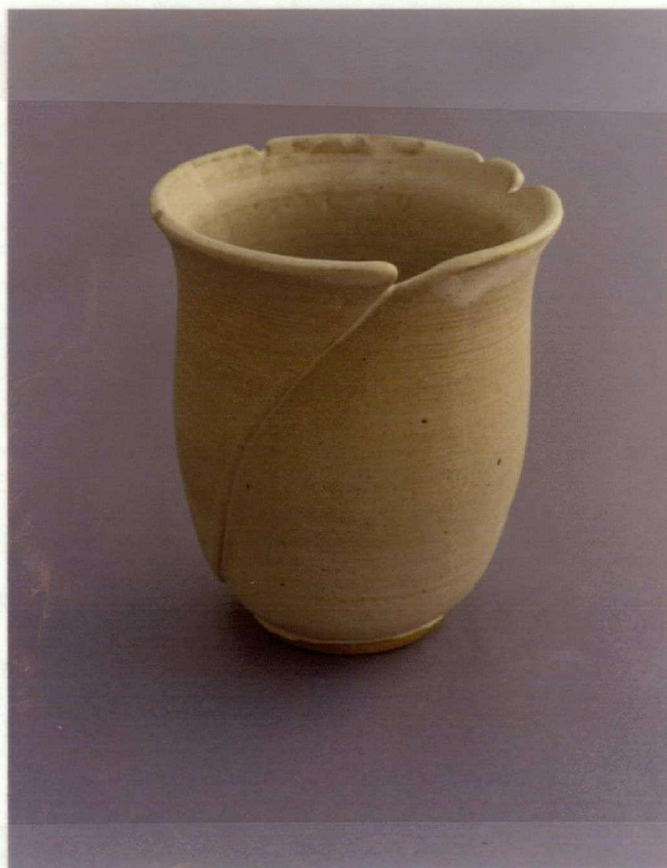


FIGURE 25

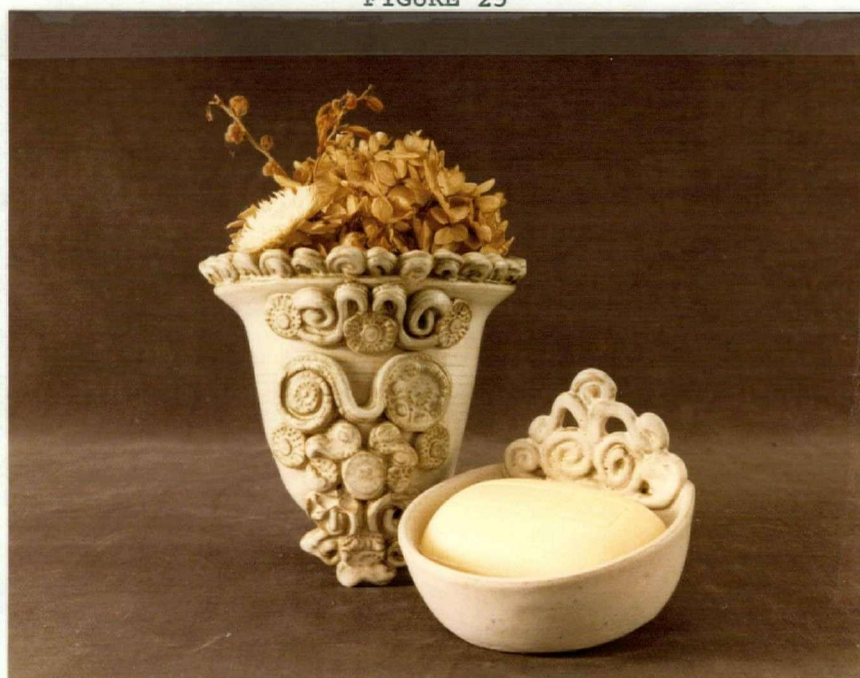


FIGURE 26



FIGURE 27



FIGURE 28

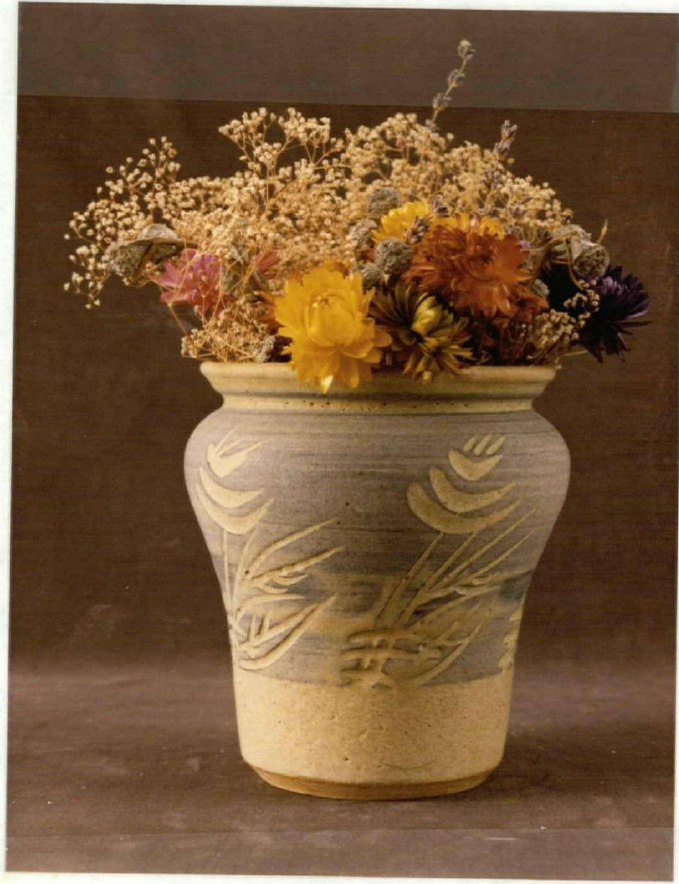


FIGURE 29



FIGURE 30



FIGURE 31

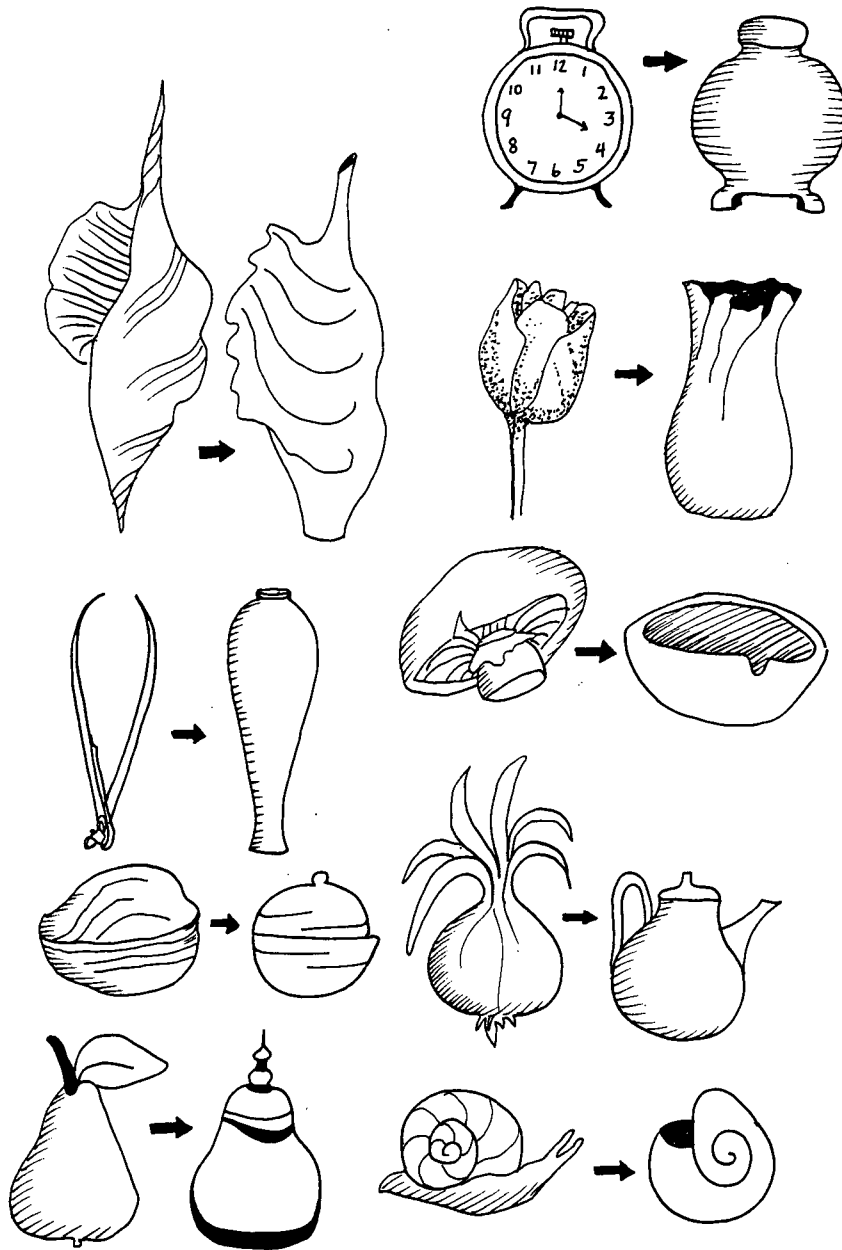


FIGURE 32

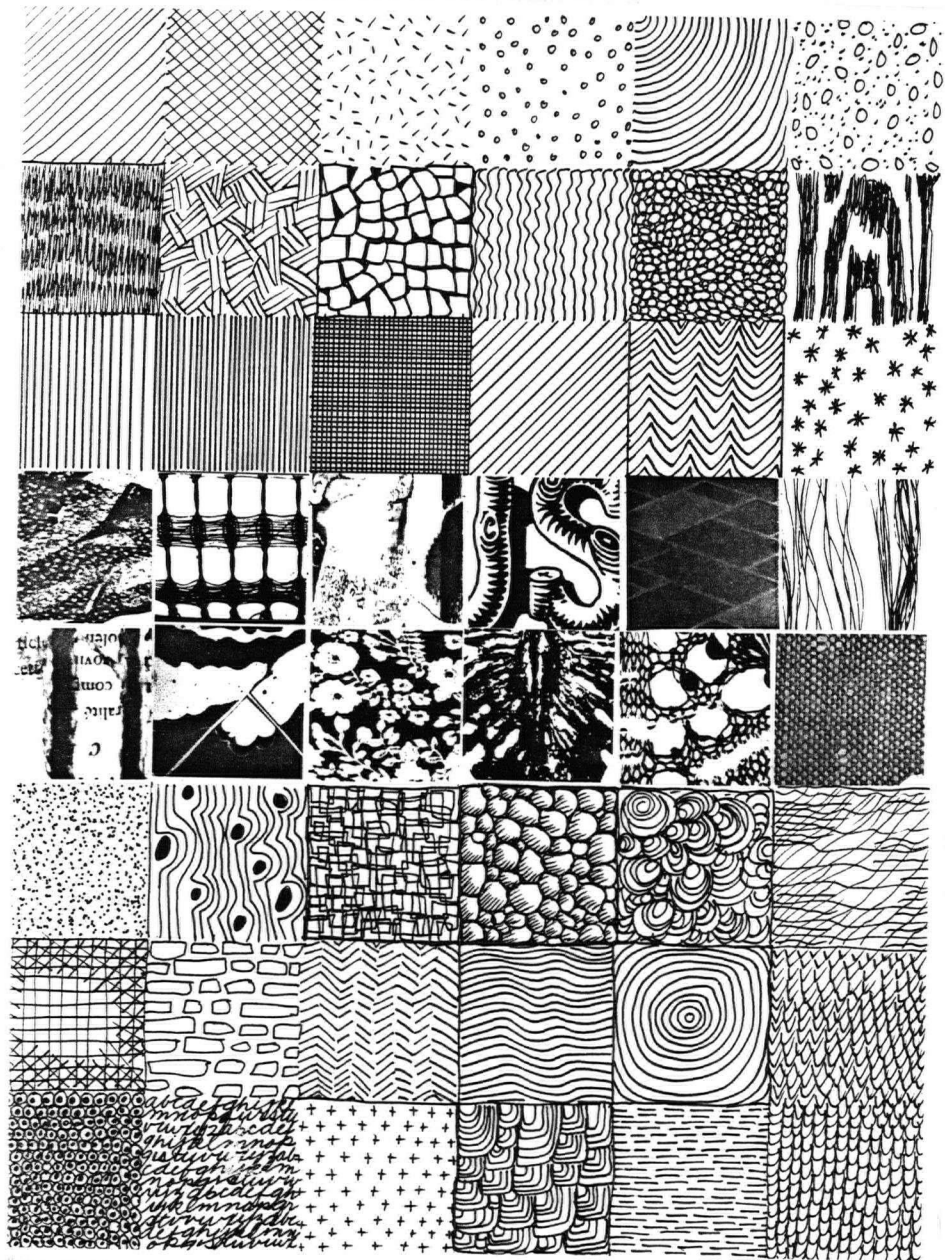


FIGURE 33

Appendix A

IMPORTANT EQUIPMENT FOR CERAMICS CLASSROOMS

1. Electric wheels or kick wheels
2. Pugmill
3. Ball mill
4. Grinder
5. Large plastic garbage cans with lids
6. Plaster bat or table top
7. Storage cupboards with doors to store damp work
8. Plastic bags for storage and slow drying of clay
9. Sinks which can be plugged to stop clay residue from going down the drain
10. Electric kilns and equipment for firing (firing cones, shelves, furniture, kiln wash, etc.)
11. Gram scales and equipment for glazing (chemicals, buckets, rubber gloves, sieves, etc.)
12. Canvas covered tables for wedging
13. Ventilation fan for removing fumes and dust
14. Separate locked storage area for poisonous chemicals
15. Vacuum cleaner (industrial, if possible, for cleaning kilns and dust)

TOOLS FOR WHEELWORK AND HANDBUILDING

1. Cutting string (linen fishing line, thin twisted wire)
2. Pin tools (bamboo skewers or needle at the end of a cork)
3. Sponges (man-made and/or natural sea sponges)
4. Plastic bowls for water
5. Trimming tools (wooden and wire)
6. Ribs (wooden, rubber and metal)
7. Bats (wooden and wire)
8. Rollers (dowelling of various widths)
9. Guide sticks for slabs (strips of 1/4" wood)
10. Sponges on sticks for deep pots (sponge tied on old paintbrushes)
11. Chamois for smoothing rims (wet paper towel works also)
12. Texturing tools (kitchen utensils such as forks, spoons, graters; household items such as clothespins, nails, brushes)

Appendix B

CLAY RECYCLING

All clay which has not been bisque fired, glaze fired, or contaminated with plaster can be reclaimed and used over again. This is a practical and economic procedure in which everyone must participate. We receive our clay in 50 pound boxes in the moist state. The clay is commercially manufactured, aged and ready to use except for some initial wedging and kneading. Once something is made from the moist clay, it is set aside and allowed to dry slowly in a damp cupboard. After the piece becomes leatherhard, it may be placed in the greenware cart to become bone dry before bisque firing. If you decide to recycle your work at the leatherhard stage you must let it dry out completely before adding it to a wet bucket as leatherhard clay does not absorb water readily and will remain quite hard rather than breaking down. There will be buckets labelled for leatherhard clay. Bone dry clay may have water poured over it immediately. Within a few hours it will have absorbed all the water and will be very sloppy, muddy-looking clay again. This clay must be dried out somewhat before it is back to its original consistency. Plaster drying bats may be used to dry out clay if handled with some care. It is important to avoid getting any plaster chips in the clay as even the smallest pieces can cause dents and holes in a piece of clay's surface during firing. Use the wooden table with the plaster top as a drying area for sloppy clay. Once the clay is dried out it may be wedged and kneaded into shape for use again. Use the canvas covered tables for wedging and kneading. If you have to scrape clay off the canvas tables use a flat wooden tool to avoid tearing the canvas. Tables should be sponged down and left clean after use. Put any useable clay scraps in a recycling bucket or through the pugmill.

The pugmill is designed to help with the clay recycling process. Its blades cut through the clay making a smooth and consistent texture. It also takes much of the air out of the clay, producing a more workable clay. The clay which is put through the pugmill must be of the proper consistency. If the clay is too hard, it will have trouble being pushed through and will put a strain on the motor. If the clay is too soft, it will also have trouble being pushed through and will tend to churn around on the blades. You will be able to recognize the proper consistency with time and experience. The pugmill must be handled with care and respect as it can be dangerous to the untrained user. Always seek instructions before attempting to operate any classroom machinery. The scraps of clay left over from the work on the potter's wheel, as well as the creamy slip produced, are usually too soft to go through the pugmill and as such should be either dried out on the plaster table or put in the very sloppy wet buckets by the sink. Do not pour these wheel scraps into the sink as they are valuable to use for other projects. The clay which settles at the bottom of the clay sink is often of very little use because it is not good enough to be recycled. For this reason it is important to pour as little good clay as possible into the clay sink. The clay sink has a trap to stop clay from going down the sink and plugging up the plumbing. The simple plastic tube which can be screwed on or off works very effectively to stop clay from going down the drain. The water in the sink should be let out periodically and the

sediment at the bottom should be cleaned out and disposed of. It is our mutual responsibility to see that the clay recycling program works smoothly and consistently. Make sure that you store clay in the proper places.

Appendix C

SIMPLE SOLUTIONS

1. Vinegar mixed with slip is an excellent mending glue for repairing cracked greenware.
2. Wet paper towel makes a good inexpensive rim smoother for pots.
3. An old hairdryer is a convenient quick pot dryer.
4. Empty spray pump bottles work well to keep greenware evenly damp.
5. Bamboo skewers or needles in corks make acceptable pin tools.
6. Children's printing letter sets make good stampers for making words on greenware. Alphabet macaroni also works for smaller printing. It can be left in the clay to burn out during firing. Toothpicks can be used in the same manner for making small weed pot holes.
7. Cookie cutters can produce a series of similar shapes which can then be altered or modified to use on pots or in sculptures.
8. Chalk works well for drawing patterns on greenware or bisqueware.
9. Thick foam rubber sponges can be altered into decorative stamps by burning them with a wood burning tool kit.
10. A metal or wooden spoon will burnish a trimmed foot rim into a smooth, scratch-free surface.
11. Dowelling makes good slab rolling pins.
12. Fishing line (linen or nylon) makes a strong, inexpensive cutting wire.
13. Kitchen sieves make hair-like strands when soft clay is pushed through them.
14. A looped wire makes a satisfactory coil handle maker. To make a handle the looped wire is dragged evenly over a solid clay block.
15. Toothbrushes or hacksaw blades make a good scoring or scratching tool for preparing two surfaces which will be joined together.
16. Varying sizes of Chinese ink brushes make interesting glaze brushes.
17. Patterns cut into rolling pins provide interesting slab results when rolled over flat clay surfaces.
18. Cutting stiff plastic lids from containers in half makes good flexible potter's shaping ribs.

Appendix D

(Electric) KILNS

Most schools have electric kilns. They are a logical and practical choice for schools as they are relatively easy to fire and maintain. They are quite safe when used properly and produce reliable, consistent, and sometimes even inspiring glaze results. Kilns come in various sizes and may be either top or front loading. Electric kilns are built with a series of on/off switches which are used to control the heating up of the kiln. Those kilns with finite temperature control (those which can be heated very gradually and slowly) are best for doing bisque firings in as careful control of the speed of firing is essential to avoid cracking and explosions. If a kiln heats very quickly, it may be necessary to turn it off and on to control the firing speed. Once a piece is bisque fired and glaze has been applied in preparation for the second firing, the speed of heating up the kiln is not so crucial. Most school kilns have pyrometers installed which are designed to tell the inner temperature of the kiln. Pyrometers, along with the use of pyrometric cones which are placed in the cone sitter, enable kilns to have a fairly accurate automatic shut-off system. The system works in the following manner: once the inside of the kiln has reached the maturing or melting temperature of the specific cone, causing it to bend in the middle, a latch at the outside front of the kiln flaps down which breaks the electric circuit and stops any further firing. It is important, however, not to rely entirely on this system as it has been known to fail for various reasons. For instance, if a piece of equipment was pushed in front of the kiln, it may block the latch and prevent it from falling down completely enough to cut off the electricity. This kind of situation would cause the kiln to overfire and no doubt cause extensive damage to the kiln as well as to anything being fired. It is very important for the instructor to be on the premises close to the time the kiln is scheduled to finish firing in order to avoid any overfirings. It is also important to fire only up to the recommended cone or temperature level as correct firing avoids stress on the elements. The recommended limit for most school kilns is cone 6, or 2246 degrees F. The wire elements or heating coils are probably one of the few problems to deal with in electric kilns as they do tend to become fatigued and weak from constant use and may have to be partially or completely replaced periodically. One should not attempt to do the element replacement on one's own as qualified personnel are required for this kind of job. The Vancouver School Board provides a very fine repair service which is available on short notice. Instructors can, however, insure the long life of elements by being careful not to get kiln wash or wet glaze on these wires as they both cause eventual breaks. Also, any chips of clay should be vacuumed regularly out of the coils. Kilns should be constantly maintained for maximum efficiency.

The kiln should ideally be positioned in a separate room from the working classroom and certainly not be placed against walls or wooden cupboards. If the kiln is not in a separate room there should be adequate ventilation in the working classroom. A ventilation fan designed to carry fumes and dust particles to the outside of the room

should be installed. There should also be windows that allow fresh air to circulate in the room.

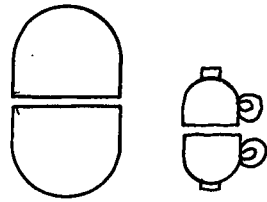
The time it takes to do a firing really depends on the type and quality of kiln one has. Most electric kilns have a ten hour time which can be set and re-set if more time is needed. Some kilns have twenty hour timers which are even better for fine control of firing time. An average firing, however, probably takes about ten hours. Only qualified and trained persons should attempt to fire kilns. If one is in doubt about the procedures involved one should arrange for professional instruction before proceeding. The Vancouver School Board offers workshops in kiln operation as a professional development service to teachers. Students should be involved in the firing processes as part of a total understanding of ceramics but should be monitored and supervised by the classroom teacher in order to ensure safe and accurate results. Kilns are considered by many to be as individually tempered as people and are often given affectionate nicknames by various classes of students.

As with many artistic processes the success of the end results in ceramics often depends to some extent on the materials and extra equipment available for smooth kiln operation. The following list offers some suggestions for equipment to ensure proper firings:

- (a) kiln shelves of various sizes to fit specific kiln
- (b) kiln furniture of various heights and widths
- (c) pyrometric cones of various temperatures corresponding to the type of clay being used
- (d) kiln wash for painting kiln shelves (bought commercially or made from combining 50% silica plus 50% kaolin plus water into a thin, creamlike consistency)
- (e) asbestos gloves

FIRING THE BISQUE KILN

Cone 06 or 1873 degrees F.

1. Check that all switches are in the off position.
2. Check that no pieces of clay are nestling in the elements. Clean or vacuum them out if you see any.
3. Set proper cone in kiln sitter.
4. Check shelves for glaze drips and loose kiln wash chips. Clean shelves carefully before using them. Wear goggles and gloves.
5. Check greenware carefully:
 - (a) fire only pieces which are bone dry
 - (b) fire only pieces which are clearly labelled with students' names and classes
 - (c) fire only pieces in good condition (i.e., no cracks or broken parts)
6. Stacking the kiln:
 - (a) handle all greenware carefully as it is extremely fragile
 - (b) load the large and heavy pieces on the bottom shelves
 - (c) load small pieces inside large pieces
 - (d) do not stack pots inside other pots which are similar in size as when they shrink they may lock together
 - (e) stack cups and bowls in this manner:
 - (f) do not allow pieces to touch kiln walls or elements as this could cause an explosion
 - (g) make sure that kiln shelves are securely balanced on kiln posts before loading pieces
 - (h) try to fit as many pieces in a firing as will comfortably fit, as good kiln packing conserves energy.
7. If you have any questions or concerns consult the teacher.

8. Allow adequate time for cooling before opening kiln--opening too quickly can cause breakage.

FIRING THE GLAZE KILN

Cone 6 or 2246 degrees F.

1. Check that all switches are in off position.
2. Check that no pieces of clay are nestling in the elements. Clean or vacuum them out if you see any.
3. Set proper cone in the kiln sitter.
4. Check shelves for glaze drips and loose kiln wash chips. Clean shelves carefully before using them.
5. Check bisqueware carefully:
 - (a) fire only pieces which have clean glaze-free foot rims or bases
 - (b) fire only pieces which are in good condition
 - (c) examine lids and their pot rims to ensure that both are glaze-free where they touch each other.
6. Stacking the kiln:
 - (a) handle all glazed bisqueware carefully so the glaze is not brushed or chipped off
 - (b) glaze pieces must not touch each other so leave at least one half inch between pieces
 - (c) do not let pieces hang over the edge of shelves as this could cause warping or slumping
 - (d) leave the tallest pieces for the top shelves
 - (e) avoid putting pieces too close to the kiln sides as this could cause warpage
 - (f) pack as economically as possible--this may take some careful preplanning.
7. If you have any questions or concerns consult the teacher.
8. Allow adequate time for cooling before opening kiln--at least as many hours of cooling as of firing would be a good rule of thumb.

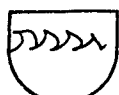
Appendix E

AVOIDING THROWING PROBLEMS

1. Start with an appropriate size of clay (first size for beginners). Graduate to larger sizes.
2. Have clay properly wedged and kneaded so there is no air inside the mound.
3. Have clay the proper consistency (not too wet nor too dry) and the proper shape of flat on bottom and rounded on top.



4. Have wheelhead dry so clay will stick and not come flying off during centering.
5. Have all tools needed in bowl of water before beginning:



water



sponge



pin tool



string



trimming tool

6. Use water sparingly to prevent clay cracking and slumping.
7. Work as quickly and efficiently as possible as overworked clay slumps from fatigue.
8. Use proper and comfortable body positions for various phases of throwing:

(a) The centering process can be approached in many ways but here are some general rules regarding wheel and body positions:

- Wheel should be going counter-clockwise.
- Arms should be locked in at sides or resting on thighs so they won't move about.
- Pressure from left hand at base of clay mound should provide a counter to the centrifugal force of the wheel spinning counter-clockwise. The right hand provides pressure on top of clay mound to prevent it from coning upwards.
- Wheel speed should be fairly fast for centering ease.

(b) The opening process has some general rules:

- Using thumbs as a drill, push a steady even hole in the center of the clay mound, being careful not to go to the bottom. Use a pin tool to measure clay left and leave at least 1/2 inch.
- Once the clay is opened, the bottom or floor of the pot must be flattened and compressed. This process can be done by pressing with the tips of the fingers from the center of the pot floor to the outer edge and vice versa. This is an extremely important step as compressing the floor reduces the likelihood of cracks appearing during the drying process. The walls and floor should also be perpendicular to each other at this stage.
- The top rim of the clay can be altered into a cone shape at this stage by applying pressure gradually from the bottom of the pot to the top, bending clay inward as hands move up to the rim. This shape counters the tendency for pots to flare out at the rim.

(c) The lifting process has some general rules:

- Lift with both hands working in unison. The left hand should be inside the pot and the right hand should be outside. Steady even pressure should be applied to the clay as it is being slowly lifted up. This pressure thins the walls and helps to bring the clay upward. This process is somewhat like patting one's head and rubbing one's stomach at the same time. Try to judge the clay's elasticity so as not to leave the walls too thick or too thin. Repeat this process until desired height is achieved. (For cylinders only.)

(d) The shaping process has some general rules:

- To make a pot rounded out more pressure is applied on the inside than the outside.
- To make a pot flared out more pressure is applied on the outside than the inside.

(e) The removing the pot from the wheel process has some general rules:

- The pot must be sponged dry, especially on the inside bottom of the form.
- The wheelhead should be clean and free of excess clay.
- The bottom outside rim of the pot should be trimmed as much as possible and dry before removal is attempted.

- Clean water should be sponged onto wheelhead surrounding pot.
- A tautly held cutting string should be pulled flat under the pot, pulling the water under the pot.
- The pot should then be slid off the wheel (using dry hands) onto a wet wooden bat.

Appendix F

WAYS TO ENRICH CLAY SURFACES

1. Drape a string dipped in oxides or slip over a pot or sculpture. Follow the shape of the form or allow string to fall randomly.
2. Draw on a clay surface with oxides, stains, or engobes. Draw over or under glazes.
3. Rub oxides into impressed clay areas. Wash clay surface with water to bring out pattern. Leave plain or glaze over.
4. Put various thicknesses of rubber bands around pot for a resist design. Paint over bands with oxides, slip, or glaze. Remove bands before firing.
5. Use melted wax or ceramic wax to paint, splatter, or dip a resist design on bisque. Glaze after waxing.
6. Draw on clay surface with underglaze pencils. Do a black and white line drawing or a shaded form. Coloured pencils could also be used for more realism.
7. Cut paper stencils to apply to clay surfaces. Paint oxides, slip or glazes over stencils. Remove stencils when dry or burn off paper in firing. Grasses, twigs, flowers could be used.
8. Use a comb or forked tool to create ridges of lines in soft clay. Lines may be straight or wavy.
9. Paddle clay surfaces with textured or smooth wooden tools to alter clay shape and pattern.
10. Imprint into clay surface by pressing an assortment of tools into form.
11. Applique separate piece of clay onto clay surface. Use different colours of clay.
12. Mold a specific shape out of clay and apply to clay surface. Use more than one sprig mold for unity and repetition of theme.
13. Scratch (scraffito) into slip covered clay surface to reveal clay body colour. Scratches may be abstract or controlled.
14. Use a feather dipped in slip to train patterns on clay surfaces.
15. Use just the shape of the brush hairs on various kinds of paint brushes to print patterns on clay surfaces.
16. Dab a sea sponge dipped in oxide over clay surface for a rich texture.

17. Melt glass chips or enamel lumps onto glazed clay surfaces for added colour and crackled texture. Use these chips in a clay cloisonne.
18. Try to abstract reality and simplify lines in designs. Try nottstrip tracer. Compare results on each leaf.
20. Double dip a pot in two glazes. Try to control the shapes produced after some random designs have been made.
21. Cut into a clay surface with various types of tools including pin tools and turning tools to create lines of different thicknesses.
22. Draw a design on a clay surface. Cut away the background clay surrounding the design to produce a raised surface.
23. Roll a clay slab over an old linocut (use several linocuts) to produce a raised clay design. Add to the design or alter it in some way to create an original image.

Appendix G

GLAZES

What is a glaze?

A glaze is a glassy coating or finish used on ceramic ware to enrich the clay surface and to render it waterproof. Glazes are composed of three main ingredients: silica, alumina and flux. Silica and alumina are two ingredients found in clay and, in fact, clay could be used as a glaze itself except that to melt clay into a glass form would require extremely high firing temperatures. To lower melting temperatures of glaze ingredients a flux is added. (So glazes contain all three elements.)

Glaze ingredients

Each of the three main ingredients in a glaze has its own function. SILICA is the glass-making ingredient, and it is found in nature in the form of sand. It comes to the potter for glaze-making in the form of flint, a fine white powder. Silica, or flint, has an extremely high melting point, however, and in order to make it form a glaze at a lower temperature an ingredient called flux must be added.

FLUX is the second ingredient of a glaze, and because there are many different kinds, each producing a characteristic type, glazes are usually classed by the type of flux used. For example: lead glazes are those that use white lead (in the form of a fine white powder) as a flux. Feldspathic glazes are high fire glazes using feldspar as a flux. Alkaline glazes are those that contain borax or soda as a flux.

ALUMINA is the third ingredient of a glaze. It controls the viscosity of a glaze and keeps it from running off the clay during the firing. Alumina is found in clay, and potters use those such as china clay, kaolin, ball clay or ordinary pottery clay, which come in the form of fine powders.

What kinds of glazes can be used?

1. Clear Transparent Glaze - This glaze is extremely shiny and will allow the colour of the clay to shine through. It is much like putting varnish on wood. To produce colour with a clear glaze a piece can be decorated first with a slip, stain, oxide or engobe. If you wanted to make a basic clear glaze less shiny or matt you could add 20% zinc oxide to the formula. To obtain a very dull glaze with no sheen at all you would add 30% zinc oxide.
2. Coloured Transparent Glaze - This glaze is the same as the clear glaze above but has had some oxides added to produce a clear coloured shiny glaze. It would look much like a transparent coloured wash on a watercolour painting. Oxides, slips, stains of different colours can also be used under coloured transparent glazes. Some of the common colorants used to produce coloured clear glazes are:

- (a) Cobalt oxide - (toxic) very intense, expensive and produces light blue to almost black. (Use 1% or less.)
 - (b) Copper oxide (toxic) - produces various shades of green; causes glaze to flow because of its fluxing action; can make glazes appear metallic. (Use less than 6%.)
 - (c) Red iron oxide - produces warm red-brown tones. (Use 5% - 10%.)
 - (d) Titanium - also known as rutile. Produces tan colours and can make interesting crystal-like effects.
3. Opaque Glaze - This glaze is dull shiny and covers the colour of the clay body. The final piece will appear to be the colour of the glaze rather than clay coloured as in a transparent glazed piece. To make an opaque glaze add 10% tin oxide or 20% zircopax. The main opaque glaze body will be white coloured. To make a coloured glaze you must add oxides or stains as in making a coloured transparent glaze. The final coloured opaque glaze will offer a pastel shade.

How to make a glaze

Glazes are made by following formulae much the same way recipes are used in cooking. Ingredients (i.e., chemicals) and equipment should be assembled before beginning. Each glaze will specify certain chemicals in particular proportions to produce a given tested result. Glazes are measured out in any form first and then have water added to form a liquid suspension. You can also experiment with making glazes by beginning with 100 grams of dry form clear transparent glaze and trying to make it coloured and/or opaque, etc. This is the equipment needed for making all glazes:

1. The gram scale - A demonstration of its use will be one of the lessons in the course. Measures dry ingredients accurately.
2. Clean paper to weigh and measure on - This can be thrown away at the end of the process and saves spreading dust and general messiness. Wipe counters also when glaze is complete.
3. A clean container to put glaze in (with a lid) - Label the glaze and attach a test cookie to each bucket when glaze has been fired to show what one can expect to see.
4. Clean implements for measuring.
5. Glaze formulae - Check off each chemical after it is added. It is easy to forget as many chemicals all look like white powder.
6. Rubber gloves - Protect skin with cuts from glaze exposure.
7. Mask for mouth - Especially important if using anything toxic. Most glazes we use are nontoxic.

8. Sieve - Once water is added to dry glaze ingredients the mixture should be sieved to ensure even chemical distribution.

For students wishing to experiment with small test glazes the following information is important:

Measuring Glazes

PERCENTAGES

We begin with 100 grams dry because:

- (a) 100 grams is easiest to figure percentages of
- (b) we don't have to consider the weight of the water added to make a glaze wet.

PERCENT MEANS "OF ONE HUNDRED"

Think of one dollar. There are 100 cents in a dollar. 1 percent means 1 of one hundred.

1 percent of one hundred cents is one cent.

You can do it easily with decimal points.

To get 1% of any number just put in two decimal points starting from the right.

That is the same as dividing a number into a hundred parts, so 1% of 100 is 1.00 or 1.

What would 5% be?

Just 5 x 1%. Right?

So 5% of 100 is:

1% = 1.00

x 5

or 5

Start out by calculating 1% and multiply that times the per cent you want. So:

	7% of	968235
is just:	1% =	9682.35
	7% =	9682.35
		<u>x 7</u>

If you want to make, say, a glaze which is not shiny, but has a little shine, and is medium blue, you would:

- (a) Measure 100 grams of shiny transparent dry
- (b) To get rid of most of the shine

Add	20% zinc oxide
	20% of 100g. is 1% of 100 x 20
	is 1 x 20
	is 20 grams zinc oxide

- (c) To make it opaque (that is, not transparent)

Add	10% tin oxide
or	20% zircopax
	10% of 100g. is 1% of 100 x 10
	is 1 x 10
	is 10 grams tin oxide

OR do it for zircopax = 20 grams zircopax

- (d) To make it a medium blue

Add	<u>less than</u> 1% cobalt oxide
	1% of 100g. is 1g.

You want less than, because your notes say that 1% would give you a strong blue. So take a guess, but measure and record what you measure.

Mixing Glazes

Once your dry ingredients are measured for either a small test batch of glaze or a larger tested glaze you need to add enough water (a little at a time) to make glaze the consistency of coffee cream. Glazes

which are too watery will look washed out and brittle and will not cover the clay surface properly. Glazes which are too thick will be difficult to apply and will end up looking like cupcake icing when fired. The three methods we can use for mixing glazes once the water is added are:

- (a) Put a small batch in a jar with a lid and shake vigorously to mix.
- (b) Put a large batch with a strong colorant or speckling agent in the ball mill (a demonstration of its use will be taught as a lesson) to ensure very smooth mixing.
- (c) Strain the glaze through a fine mesh screen. Use a rubber scraper to push mixture through to avoid damaging the screen. Sieve all glazes. Label and lid all buckets when finished.

Applying Glazes

First check the glaze consistency. Make sure the glaze is properly stirred as water tends to rise to the top of an unused glaze. If the glaze has dried out or thickened add a little water gradually to achieve the proper thickness.

The two main methods we use to apply glaze are pouring and dipping or brushing. Do not contaminate glazes with careless glazing methods. Rinse brushes and materials before putting into new glaze buckets. Remember to leave the bottom and at least 1/2 inch up the side clear of glaze.

Appendix H

HEALTH AND SAFETY IN THE CERAMICS CLASSROOM

One of the important roles of the teacher in the ceramics classroom is to be a provider of information regarding health and safety. The teacher should also act as a role model and personally maintain high standards of procedures in these areas. There are many potentially hazardous situations in a ceramic studio which can be safely avoided or dealt with if students are properly instructed in and are encouraged to maintain good housekeeping standards. The most prevalent health concerns are probably those associated with the dust condition. Small particles of dust invisible to the naked eye are forever present in the air. Constant inhalation of these particles over an extended period of time can cause serious lung and respiratory problems such as silicosis. In order to deal with the dust situation in the best manner possible, it is essential to have a good ventilation system installed. The system should consist of an exhaust fan capable of transporting dust and fumes to the outside of the classroom. It is also important to have windows which can be opened to allow fresh air to circulate periodically. All dust covered surfaces such as shelves, cupboards, and table tops should be washed down on a daily basis. Ideally, a ceramics classroom should be designed in such a way as to be able to be hosed down and also be provided with drainage slots in the floor, to carry excess water away. However, as most are not designed this way, damp mopping is the only alternative method of controlling floor dust. A good industrial shop vacuum cleaner is also an asset in dust control as well as in kiln maintenance.

One of the other main areas of health concerns involves the storing, mixing and use of glaze chemicals and ingredients. The chemicals used to make glazes are often toxic to a greater or lesser degree and as such should be stored in either plastic buckets with well fitting lids, or in glass lidded jars. It is important not to store these chemicals in paper or plastic bags (as they often come in from the suppliers) as these bags tend to deteriorate and are not safe from leaks and spills. Each bucket must be accurately labelled as to content and toxicity of content. If possible, all chemicals not in immediate use should be stored in a separate area from the working classroom. It also makes good sense to set aside one area of the working classroom or even a separate room, if possible, for storing buckets of made up glaze and for doing the actual glazing procedure. This area should have a plastic-covered or arborite surface to facilitate the wiping up of glaze spills. The brushes, bowls and other tools used in glazing should be removed from the buckets and washed immediately after use. The lids should be secured properly on the glazing buckets. Gloves should be worn to prevent glaze contact with the skin and these gloves can be easily supplied.

Students should be carefully instructed in the proper and safe procedure for mixing glazes. There should be no food or drink in the ceramic classroom at any time, but especially during glaze making and application. Students must be careful to wash their hands after working with glazes. Smocks and cover-ups should be washed regularly as well as

ordinary clothes worn in the classroom. Once glaze chemicals are ready to be weighed and measured, protective face masks can be worn to prevent any inhalation from dust from chemicals.

The firing of kilns also presents a health concern as gaseous fumes are given off during the procedure. If possible, it should be arranged so that firing takes place as little as possible during the school day. If a school is a community one which offers night classes in ceramics by a qualified instructor, a satisfying mutual exchange of help with firings can often be worked out. It is not a good idea to rely on pyrometric cones to turn the kiln off as they have been known to fail. A qualified instructor should always be on the premises when a kiln is scheduled to stop firing.

Kilns produce heat and as such present possible fire hazards. Students must be aware of when kilns are firing and/or cooling down so that they are never opened mistakenly. Any flammable objects must be stored away from kiln areas and, of course, never placed on top of firing kilns. A fire extinguisher should be readily available for any emergency. Asbestos gloves should be used during kiln unloadings and any warm pieces of work should be stored in flame resistant surfaces. Kiln shelves can also present problems if small pieces of glaze are stuck to their surface. These small glaze chips are as sharp as razor blades and can produce very deep and painful cuts if handled carelessly. The pieces should be chipped off outside the room using a file and wearing eye protection.

Any other machinery in the classroom such as pugmill, grinder, and ball mill all require adequate instruction in their proper and safe operation before students are allowed to use them.

Appendix I

THE CLAY PROCESS FROM START TO FINISH

1. Soft clay (can be easily wedged, kneaded, and formed by hand or wheel)
2. Soft leather hard (can be altered by paddling, imprints and appliques)
3. Leather hard (can be altered by trimming, decorating with carved textures, adding handles, drilling holes)
4. Bone dry (clay is called greenware and appears lighter in colour and weight; clay is very fragile and chips easily; clay is ready for the first firing; clay can still be recycled at this stage by adding water to it)
5. Bisqueware (clay has been fired once and chemically altered; clay appears different in colour and is hard to the touch like stone; clay cannot be recycled at this stage; clay may be decorated by staining, waxing and glazing; clay is ready for final firing)
6. Glazeware (clay has been fired for the final time and will have reached the maturing temperature to render it extremely hard to the touch with a glass-like covering)

Appendix J

NOTEBOOK EXERCISES FOR CERAMICS

1. Draw a cylinder shape. Change the cylinder shape to new shapes in a series of progressive drawings. Choose some pleasing ones to try to reproduce on the wheel.
2. Draw tiny things from nature (bugs, stones, rocks, leaves, crystals, and seed pods). Try to separate essential forms from accidental ones.
3. Draw any objects you like--alter them into pot shapes. How would they appear as pots or sculptures? What would you change, alter, modify, adjust, and adapt?
4. Choose a theme--draw a series of pots or sculptures based on your theme--choose one or several to translate into claywork.
5. Study a style or type of pottery (country, period in history). Sketch main ideas representative of style or period chosen. Do a piece of claywork in this style.
6. Do a photographic study of clay forms and/or sculptures, mosaics, architecture.
7. Collect examples of forms, textures, patterns, etc., which appeal to you as finely designed and interesting. Think of how these pieces could influence your own work.
8. Draw everything which interests you. All drawing work done can play some part in your ceramic art.

Appendix K

BEGINNERS BASIC COURSE REQUIREMENTS

POTTERY 9/10

1. Time:
2. Fee:
3. Materials required:
 - a. notebook (for handouts and recording other classroom information)
 - b. smock or cover-up (old shirts or coveralls are good)
 - c. toolbox or strong container including the following items:
 - pin tool (needle in a cork or bamboo skewers)
 - wooden trimming tool (pieces of carved driftwood)
 - cutting wire or string (nylon or linen fishing line)
 - sponges
 - shaping rib (end of plastic spatula)

Tools will be provided for shared use but if you prefer to have your own personal ones, the above list offers some readily obtainable and inexpensive suggestions.
4. Course requirements: specific assignments will be given in each area.
 - a. Clay preparation
 - wedging
 - kneading (rams head/spiral)
 - recycling (use of pugmill)
 - b. Handbuilt claywork
 - pinch
 - coil
 - slab
 - molds
 - combination techniques
 - c. Wheelwork
 - centering
 - opening
 - compressing base
 - pulling form
 - shaping
 - trimming

Assignments will include making basic shapes such as cylinders, bowls, pitchers with pulled handles.

d. Surface enrichment and decoration techniques

- scraffito
- incising
- wax resist
- impressing
- oxide staining

e. Glazing

- basic techniques (brushing, dipping, spraying)
- basic understanding of simple glaze formulae

f. Kiln loading and firing

- bisque kiln
- glaze kiln

g. Understanding and using design principles and elements in claywork

- | | |
|-----------|------------|
| - line | - harmony |
| - texture | - balance |
| - pattern | - unity |
| - shape | - contrast |
| - colour | - emphasis |
| - rhythm | - movement |

h. Teacher and student evaluation of student's progress

Appendix L

INTERMEDIATE TO ADVANCED COURSE REQUIREMENTS

POTTERY 11/12

1. Time:
2. Fee:
3. Materials required:
 - a. notebook (for handouts and other classroom information, idea source)
 - b. smock or cover-up (old shirts or coveralls are good)
 - c. toolbox or strong container including the following items:
 - pin tool
 - wooden trimming tools
 - cutting wire or string
 - sponges
 - shaping rib

Tools will be provided for communal use but if you prefer your own personal ones the above list provides the basic tools needed.
4. Course requirements: specific assignments will be given in each area.
 - a. Review of clay preparation, clay recycling, studio procedures.
 - b. Handbuilt claywork - complex forms
 - use of all techniques (pinch, coil, slab, molds) learned in basic course in various combinations.
 - sculpture - additive/subtractive, mixed media
 - combination handbuilt and thrown pieces
 - c. Wheelwork - specialized techniques and forms

<ul style="list-style-type: none"> - big bowls - lidded forms - goblets - thin-necked bottles - throwing off the hump 	<ul style="list-style-type: none"> - plates - teapots - miniature pots - sectioned throwing - coil throwing
--	--
 - d. Knowledge of different types of clay
 - earthenware
 - stoneware
 - porcelain

e. Glazing

- mixing glazes from formulae
- knowledge of glaze defects and how to correct them

f. Surface decoration techniques

- | | |
|-----------------------------|------------------|
| - feather combing | - clay cloisonne |
| - slip trailing | - stencils |
| - piercing | - sprig moulding |
| - underglaze pencil drawing | - clay applique |

g. Ceramic Art Study - written assignment with photographs and illustration

- historical, cultural review
- ceramics from a specific country
- ceramics by an individual artist from either the past or the present
- ceramic style such as purely functional, pop or large gallery pieces

h. Emphasis on working to promote personal imagery and style

- developing themes
- enlarging sources and resources of imagery
- expanding visual language

i. Ceramic Appreciation

- films
- field trips
- discussion groups
- visiting artist speakers

j. Student and teacher evaluation of student's art growth

Appendix M

STUDENT SELF-EVALUATION FORM

NAME:

DATE:

PROJECT TITLE:

RATE YOUR PROGRESS BY ANSWERING, AS OBJECTIVELY AS POSSIBLE, THE FOLLOWING:

POOR FAIR GOOD

1. I handled the materials I used well.
2. I handled the tools correctly.
3. My finished work shows technical ability.
4. I participated in the class discussion.
5. My work shows uniqueness of ideas.
6. My work approach was original.
7. My work is completed in all aspects.
8. My work represents my best effort.
9. My work corresponds to the given problem or assignment. I followed instructions.
10. I have participated in clean-up activities and have contributed positively to the classroom environment.
11. I have learned some new skills and/or ideas from working on this project.
12. I enjoyed my working process and my end product.
13. My overall grade for this project is:
14. Please add any further comments in the space provided below:

STUDENT DESCRIPTIVE EVALUATION FORM

NAME:

PROJECT TITLE:

Describe your finished work as accurately as possible. Use proper terminology and try to convey what you were trying to do in your work: