

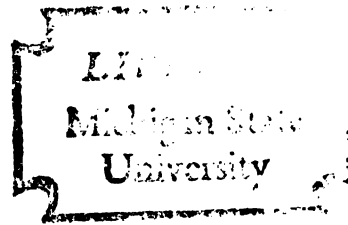
AN INVESTIGATION OF
THE DYNAMICS OF THE
LEARNING CELL

PH. D.

MICHIGAN STATE UNIVERSITY

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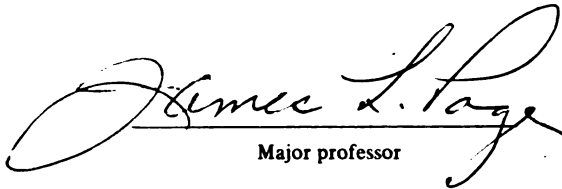
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ABSTRACT

AN INVESTIGATION OF THE DYNAMICS OF THE LEARNING CELL

By

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A learning cell is a two-person (dyad) interaction system in which the members teach and learn from each other. The primary purpose of this study was to collect data on the dynamics of the learning cell and to identify those particular dynamics that may either facilitate or hinder the learning cell's effectiveness in a formal educational setting. A secondary purpose was to identify those variables which future controlled experimentation could study. Specifically, the study attempted to provide data on three particular dynamics: 1) perceived output by students, 2) internal activities, and 3) composition. Data were collected via a questionnaire and interview of students who had participated in the learning cell activities in order to: 1) determine their attitudes regarding the learning cell dynamics, and 2) identify the reasons underlying these attitudes.

The treatment consisted of structuring a community college course in psychology to include lectures, readings in the textbook, large group discussions, and learning cell activities. During the study, 32 students were randomly paired into 16 learning cells. For a typical week, the students were responsible for reading weekly assignments which were supplemented with a one hour lecture followed by a half-hour learning cell activity. The learning cell activity was followed by a half-hour open

discussion with the total class after which the students spent another half-hour in learning cells.

Several instruments were constructed to help guide students in organizing and discussing the material. Weekly study guides were constructed by the instructor and contained the important points of that particular week's assignment. These were used to generate topics of discussion in the learning cell. The students were also given suggested learning cell patterns which provided them with various examples of how to structure their discussions.

After four weeks, or approximately four hours of learning cell activity, the students completed a learning cell questionnaire which was used to collect a base of information regarding the students' attitudes toward the learning cell. Personal interviews were then conducted with each student. The interviews lasted about 45 minutes each and were audio-taped. Each student's learning cell questionnaire was used during the interview to probe the reasons behind the self-reported attitudes.

The following conclusions regarding the dynamics of the learning cell may be drawn from the findings of the expressed attitudes of the participants of the study.

Dynamic 1: Perceived Output by Students

Conclusion 1: The learning cell is an effective method of helping students gain a better understanding of the material being studied and should be used in more classes.

Conclusion 2: Learning cells do not increase student motivation to prepare for class and examinations.

Conclusion 3: The learning cell is not an appropriate method of instruction for 20% of the students sampled.

Conclusion 4: The perceived success of the learning cell is related to how it is integrated with other instructional methods

Dynamic 2: Internal Activities

Conclusion 5: Students feel less anxiety when asking questions in a learning cell.

Conclusion 6: Study guides are needed in the learning cell to save time.

Conclusion 7: An instructor should be available during learning cell activities to answer any questions that may arise.

Conclusion 8: Learning cell partners do not object to the intensive one-to-one interaction that the learning cell demands and they feel a responsibility to each other to share the workload and discussion.

Conclusion 9: The amount of time spent in various learning cell activities must be flexible to accomodate schedule factors and other individual differences.

Conclusion 10: Learning cell partners prefer to choose their own method of structuring their discussions.

Dynamic 3: Composition

Conclusion 11: Pairing students randomly for learning cells is an acceptable method.

Conclusion 12: Difference in partner's age, sex, or race makes little difference to students in learning cells.

As a result of this study, several variables regarding the dynamics of the learning cell were identified which warrant further research.

AN INVESTIGATION OF THE
DYNAMICS OF THE LEARNING CELL

By

Paul Woodworth

A DISSERTATION

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DEDICATION

MOTHER AND DAD

It is often difficult to express just how much I love you. Without your encouragement and support this achievement would not have been possible. I pray that I can guide and assist my children as you have me.

and

CONNIE, KATIE, AND GEOFF

Thank you for your patience and understanding.

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CHAPTER I

INTRODUCTION AND PURPOSE OF STUDY

Introduction

In an attempt to solve problems of increasing responsibility combined with fewer per capita dollars, schools have placed a great deal of emphasis on individualizing instruction. Those who have followed this new trend, however, still tend to deemphasize the social aspects of education. Thiagarajan (1974), one of the foremost advocates of individualized instruction, feels that at times this method can actually be detrimental to the learner. He believed that individualized instruction enhanced a student's self-concept until Myers (1972) found that students' self-concepts actually decreased under individualized instruction. Myer's finding, along with the concern about reduced socialization among students, has led Thiagarajan to reevaluate his own use of individualized instruction. Further concern regarding individualized instruction is expressed by Hoban (1973). He notes that:

Without heavy compensation of engagements in group and team activity and interaction, individualized instruction, which is being shouted from the housetops as the New Revolution, can be antisocial both in its latent intent and in its manifest consequences. Man is a social being and must be trained as such. This is not to say that there is not room for individualization of instruction, self-pacing, or performance to full potential. But what we don't need today is more rampant individualism with its inherent self-centeredness, and its total disdain for others and for the well being of society.

Another underlying theme of most educational systems, that the only type of structured interaction necessary to learning is

that between teacher and pupil, is challenged by Jean Piaget (1964). Piaget explains the importance of active student participation in learning.

When I say "active," I mean it in two senses. One is acting on material things. But the other means doing things in social collaboration, in a group effort. This leads to a critical frame of mind, where children must communicate with each other. This is an essential factor in intellectual development. (p. 174)

In short, many students are either sitting passively listening to the teacher in a traditional classroom or working independently under the new system. Neither of these options provide students with the opportunity for interaction. This does not mean that the individualized instruction or traditional methods should be abandoned. Instead, students must also be provided an opportunity to interact with others.

Thus, assuming interaction is important to a student's education and learning, it seems natural that it be built into the learning environment. This should obligate educators to look for ways of providing students with active learning experience with emphasis on interaction. One such way is the learning cell, a two-person interaction system. This dyadic system of interaction provides its members with an opportunity to teach and learn from each other.

By nature, man has sought out others for the purpose of discussing, clarifying, or reinforcing his ideas, but only recently has interaction in the form of learning cells begun to be explored and used in a formal educational setting. Educators are beginning to realize the learning potential afforded by this

method, but Beach (1974) points out that "...educators need to know more about how students learn from each other and from learning experiences in which they have an active part and assume responsibility for their learning." (p. 188) Beach goes on to say that:

This technique is not widely reported, despite the fact that educators, social psychologists, and group dynamicists in particular have been pointing out for some time that growth and learning may be greatly enhanced and made more permanent through group interaction. One of the most productive ends which the small interactive group serves is the enhancement of learning. When the searching and sharing activity of such a group is primarily self-directed, i.e., controlled and directed by members themselves, the stage is well set for learning to occur. (pp. 187-188)

There is need for further study of the learning cell method, especially at this time when effectiveness and efficiency are among the top educational priorities. These studies, however, should not be limited to examining only certain variables but should include examination of the total effects on the learner.

Purpose of the Study

The primary purpose of this study was to provide data on the dynamics of the learning cell and to identify those particular dynamics that may either facilitate or hinder the learning cell's effectiveness in a formal educational setting. The overall dynamics of the learning cell were broken down into three major categories: 1) perceived output by students, 2) internal activities, and 3) composition.

Perceived output by students relates to the perceived effectiveness of the learning cell in helping students gain a

better understanding of the content of the course and preparing them for class and examinations.

The dynamic of internal activities refers to the degree and amount of interaction between learning cell partners, the method of structuring the content to foster discussion, and the overall process structure, i.e. time and flexibility.

The composition dynamic includes such variables as method of pairing students for learning cells and difference between learning cell partners age, sex, and race.

A secondary purpose of this study was to identify those variables which future controlled experimentation could study.

Importance of the Study

Due to increasing enrollments, larger classes, shortage of competent staff, insufficient budgets and increasing costs of instructional materials, schools are asking how they can educate more economically and still maintain high standards. Even more important, schools must somehow provide students with ample opportunity to interact and exchange ideas with others.

In recent years schools have attempted to reorganize their instructional methods to provide students with a greater opportunity to interact with their instructors and peers. These methods are known as seminars, recitation sections, or discussion groups, and all have fallen short of their goal, according to Goldschmid (1971). He feels that such problems as unprepared students, personality clashes, inadequate instructor effectiveness and student passivity all hinder the attainment of total

interaction among members of any group.

The primary importance of this study was the exploration of another instructional method, the learning cell, which may alleviate some of the shortcomings of other interactive modes.

Previous studies of the learning cell tended to examine a small number of variables. None have attempted to take an in-depth look at the dynamics of the learning cell while it was in progress. This study, by examining the dynamics of learning cell partners during their interaction, provides an important base of information for the development of instruction utilizing the learning cell. In addition, this study could generate a number of hypotheses for continued experimentation.

Definition of Terms

A number of terms used in the following discussion of the learning cell require a specific definition. Since these terms are technical in nature, it is necessary to establish a definition.

Learning Cell

A two-person (dyad) interaction system in which the members teach and learn from each other.

Instructional Development

A systematic process for the design, implementation, evaluation and subsequent improvement of instruction to ensure high quality and efficient learning.

Formal Educational Setting

Any course, workshop or instructional system which is offered by an educational institution.

Learning Cell Performance

The combined score of learning cell members on mastery tests of subject matter information or skills.

Structure

The term "structure" is used in two different contexts in this paper.

- 1) Content Structure - subject matter content that should be discussed by members of a learning cell.
- 2) Process Structure - any format or procedure of organizing or structuring the overall activities of a learning cell in a formal educational setting.

Overview of the Study

Chapter I has discussed the purpose and importance of the study.

In Chapter II pertinent literature regarding the learning cell will be reviewed. Four specific areas will be discussed: 1) description of the learning cell, 2) underlying theoretical support behind the learning cell, 3) previous studies on the learning cell, and 4) implications of previous research for the present study.

In Chapter III the research methodology is presented including: 1) population and sample, 2) treatment,

3) instrumentation, 4) pilot study, and 5) data analysis.

The findings of the study will be analyzed and discussed in Chapter IV.

Chapter V will include the: 1) summary, 2) conclusions, 3) implications, and 4) recommendations for further research.

Summary

This chapter has shown the importance of providing students with opportunities to interact with their peers. It also noted that traditional as well as modern self-instructional methods overlook the important social component of learning. The lack of interactive opportunities for learners suggests a need for research into one such method, namely the learning cell, which may partially remedy this situation. An exploratory study of this method should result in findings which can be incorporated into the development of instruction, leading to the development of the learner's interactive ability and consequent improvement of the learning process.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

In the previous chapter it was stressed that peer interaction is important to students' intellectual development and socialization. Piaget (1964) and Hoban (1973) feel that students must take an active part in the learning process, i.e. they must be provided with opportunities to interact with others. It was also noted that even though attempts are being made to provide students with alternative learning situations, the social aspect still seems to be ignored.

While the learning cell is a relatively new instructional innovation, a number of studies have been conducted. Literature pertinent to the present study will be reviewed in this chapter.

This review will be organized into four sections:

1. general description of the learning cell and discussion of other instructional methods,
2. underlying theoretical base supporting the learning cell,
3. previous experimental studies regarding the learning cell,
4. implications of previous research for the present study.

Description of the Learning Cell

This section will include a discussion of: 1) the learning cell in general, and 2) a comparison of the learning cell to other methods of instruction.

Goldschmid (1971) defines the learning cell as a dyadic learning method in which students teach and learn from other students. Alexander, Gur, Gur, and Patterson (1973) describe the learning cell as "...a dyadic unit in which the partners mutually teach and learn from each other." (p. 1)

In essence, the learning cell is composed of two students (dyad), neither of whom has achieved an instructional objective, who interact with one another for the expressed purpose of achieving the objective(s).

Comparison of the learning cell to other instructional methods

Lecture. The lecture is probably the most traditional and widely used method of instruction today. Its main drawback lies in the predominately one-way flow of communication even though some lecturers encourage questions or reactions from their audiences. Davies (1966) notes that:

Probably the best way of defining the lecture is simply to say that during most of the time the teacher or instructor is talking, so that there is very little feedback to the lecturer in terms of student responses. This delay in feedback can seriously hinder the course of student learning, particularly if the student is not well motivated and the material is complex in nature. (p. 12)

In contrast, the learning cell method can provide students with a chance to question and clarify content presented in the lecture. This does not imply that the lecture method is useless and outmoded, rather that it should be supplemented with an activity that facilitates student interaction. This is likely to lead to a better understanding of the material.

Tutorial. Tutorial teaching is generally believed to be

a valuable educational experience, but like the lecture, this method is characterized by a one-way flow of communication from tutor to tutee. There are two main differences between the learning cell and tutorial methods. First, the tutorial method often eliminates interaction as a whole. Bloom (1953) found that contrary to their own belief, most tutors monopolized discussion time and left little opportunity for the student to contribute. Gartner, Kohler, and Riesman (1970) found that the tutor benefits more in a tutorial setting than the tutee, and this was due to the insight into the teaching-learning process gained by the tutor. Thelen (1969) also found that the tutorial method enabled tutors to learn how to learn. Second, both members of the dyad are not equal in their understanding of the content. The tutor is usually a student or teacher who has mastered the content (Hapkiewicz, 1972; Sheppard and MacDermot 1970) as opposed to the tutee who generally knows very little about that specific content area. The learning cell, however, is comprised of students who have not mastered the content but at the same time have a basic understanding of it, and through interaction attempt to achieve mastery.

Programmed Instruction. This method of instruction can take many forms, but all have the common characteristics of eliciting and systematically reinforcing only correct responses. Davies (1966) reports that about one-third of the schools in the United States are using some programmed material. The advantages of this method are enumerated by Lumsdaine and Glaser (1961). They are: active student response, small steps,

immediate knowledge of results, self-pacing so that students can move at their own speed, and a low rate of error.

This method is often incorporated into individualized instruction, e.g., individualized instruction often includes a programmed instruction format. Programmed instruction has proven successful in the area of cognitive knowledge but still lacks one important element, interaction. In most cases the student usually interacts with written materials and/or mechanical teaching devices. The researcher feels that human interaction is still a very important element, and until this method provides interaction, it will be limited in its potential.

Small Groups. The size of a group is an important variable in group performance. Thomas and Fink (1963, from Davies, 1966) summarized the literature on this subject and concluded that both quality and quantity of learning improve with increase in the size of the group. Further support comes from Bales and Borgatta (1955) who report that as group size increases, tension release and giving suggestions become more evident, signs of solidarity as well as the giving of information also increase somewhat. On the other hand, tension increases considerably as the size of the group reduces, whereas agreement, asking for opinion, and the giving of opinion all increase as the group size is reduced. Davies (1966) states that:

Most of these trends appear to be the results of two main factors:

- a. As group size increases, so the amount of talking time available to each of the members is reduced.
- b. As group size increases, each member of the group has to maintain himself in a more or less adequate relationship with more and more people. (p. 46)

It is apparent that as group size increases or decreases there are both positive and negative results. The learning cell is the smallest possible group. One might expect, therefore, more interaction and more tension.

Underlying Theoretical Basis

This section will attempt to provide an understanding of the theoretical basis of the learning cell. This discussion will center around the four Principles for Designing Clarifying Environments proposed by Moore and Anderson (1969). Each principle will serve as an initial referent and will be supported by other theoretical proposals and previous research.

Designing Clarifying Environments

The learning cell seems to fulfill all of the principles for designing clarifying environments proposed by Moore and Anderson (1969). Any environment which fosters these principles is said to be a "clarifying environment."

Perspectives Principle. According to Moore and Anderson, "...one environment is more conducive to learning than another if it both permits and facilitates the taking of more perspectives toward whatever is to be learned." (p. 585) The learning cell utilizes this principle by providing the members with two perspectives, teacher and learner. This principle is supported by Bruner (1965) and Davies (1966) who feel that a good way to learn something is to teach it. The learning cell dynamics force members to alternate between the roles of teacher and learner, thus providing them with different perspectives

regarding roles and viewpoints, both of which are conducive to learning. In other words, reciprocity must be inherent within learning cells. Bruner (1968) points out that humans have a deep need to reciprocate, i.e. "...to respond to others and to operate jointly with them toward an objective." (p. 125) This may very well be the most important factor in the success of the learning cell.

Bruner further suggests that if individuals can see how they contribute to the effectiveness of the group, or the learning cell, they will become more active. The learning cell offers its members a chance to engage in some teaching and some learning. Thus, role playing and reciprocity are important elements and must be inherent in each cell activity.

Autotelic Principle. This principle states that "...one environment is more conducive to learning than another if the activities carried on within it are more autotelic." (p. 585) Moore and Anderson define an autotelic environment as one which protects its members from any serious consequence such as physical and psychological risks in order to provide them with freedom from restraints. Even though it is doubtful that a small portion of a school day could be made free from risks, it is possible that the learning cell is a step in the right direction. Students are more apt to explore ideas and raise questions in the learning cell without fear of psychological consequences than they would in front of the total class. Further support for this position comes from Torrance (1969).

In a study with five-year olds he found that when placed in pairs they would attempt more difficult tasks than when alone. He also noted that the five-year olds were least willing to attempt difficult tasks when forced to address the entire class. In another study Torrance (1970) found that subjects working in dyads rated the experience as more original than working individually. It seems then that the learning cell is an effective method to reduce student anxieties toward attempting difficult tasks and provides a more conducive environment for learning.

Productive Principle. This principle says that "...one environment is more conducive to learning than another if what is to be learned within it is more productive." (p. 585) In other words, if there are two or more versions of learning then that version which is most productive in terms of learning should be chosen. Even though there is no research to date to prove that the learning cell method is more productive than other methods, there is a possibility that this contention is true.

Personalization Principle. This principle states that "...one environment is more conducive to learning than another if it: 1) is more responsive to the learner's activities, and 2) permits and facilitates the learner in taking a more reflexive view of himself as a learner." (p. 585) The responsive environment permits the learner to explore freely and to generate questions; in turn the learner receives immediate feedback from the consequences of his actions. The purpose of the learning

cell is to allow a student to ask questions freely and to receive immediate feedback from the partner regarding the question.

The responsive condition also permits the learner to make full use of his capacity for discovery. Discovery is a matter of "...re-arranging or transforming evidence in such a way that one is able to go beyond the evidence so assembled to additional new insights." (Bruner, 1961, p. 22) Such a definition can be applied to the learning cell. Rather than a single student battling with numerous unrelated facts, two students working together may discover some or all of the relationships of the facts.

A reflexive environment is so structured that the learner not only learns but also sees how he learns. The learning cell requires interaction between its members; therefore, it allows each learner to examine his partner's ideas while also learning how his own ideas are perceived, which gives him insight into himself.

Donahue (1974) provides further thought regarding reflexive behavior in the learning cell.

Reflexive behavior might also result from playing the teacher role in the learning cell. As previously noted, preparing as a teacher and preparing as a student can be quite different. The teaching side of the learning cell offers two more referents that the learner might use to assess himself. He could compare his learning style to his own teaching style and he could compare his learning style to his partner's teaching style.
(p. 15)

One final note should be made concerning the four principles that have been discussed. No one principle can stand alone or

exist in isolation. All four must be combined to form one educational environment. The total sum of the principles will greatly enhance the effectiveness of the learning cell if they are working together.

Previous Studies on the Learning Cell

The purpose of this section of the review of literature is to report the findings of previous studies on the learning cell and those variables examined.

Since its introduction into formal educational settings, the learning cell has appeared to be effective across many subject matters. Kingsbury (1968) used the learning cell in various college level disciplines including English, psychology, philosophy, chemistry, communication, and sociology. He reported that this method proved effective across all disciplines and provided students with valuable and productive interaction. Rosenbaum (1973) successfully used peer-mediated instruction in spelling and reading with elementary school children and industrial training with adult learners. Weingarten et al., (1970) used the learning cell for military basic training programs. Shepard and MacDermot (1970), Goldschmid (1970), and Schermerhorn (1972) experimented with learning cells in an introductory psychology course. Alexander, Gur, Gur, and Patterson (1973) investigated informally established learning cells noting that the dyads studied a variety of subjects and that most dyads consisted of partners from different college majors. These studies support Goldschmid's (1971) contention that learning cells have high

generalizability and can be used in practically every type of learning situation and educational discipline.

Structure used in the context of the learning cell may very well be an important variable. One may either structure the content to be studied in the learning cell and/or activities of the learning cell.

Content structure deals with what the members of the cell should study and who should furnish this material. Should the learning cell partners or an external source such as the instructor generate study questions? Stone (1974) has suggested that more effective learning will take place if the instructor provides the cells with questions for the purpose of guiding the discussion. Kingsbury (1968), Myers, Travers, and Sanford (1965), and Hartley and Hogarth (1971) provided students with questions. Schermerhorn (1972) and Goldschmid (1970) elected to have the learning cell partners generate their own questions. Data on this variable as to its effectiveness and preference by students are inconclusive. Hence, they can be neither approved or refuted. It is likely that a combination of the two types of structure may be optimal. For example, the instructor provides the cells with an outline of the content with several questions as examples. The students use this outline as a model to generate further questions.

The structure of learning cell activities refers to the format or procedure followed by members in a cell. Goldschmid (1971) reported two successful formats for structuring learning cell activities. In the first format both members of the pair

have read the same material. To begin the learning cell, student A of the pair asks his first question and student B attempts to answer. Then student B asks his first question which student A will attempt to answer. This continues until the completion of the learning cell period. In the second option, students read different materials. Student A then teaches the essence of his material to student B and finally asks his questions. Halfway through the period the roles are reversed.

As in the previous method, neither of these two formats has been investigated as to effectiveness or preference by students. However, Alexander, Gur, Gur, and Patterson (1973) reported that learning cells which received detailed instructions about how to study together had a negative attitude toward imposed structure. They did not like being forced to adopt one specific format and would have preferred to choose their own. Yet, Benne and Levit (1953) stress the importance of structure in small group instruction. They warn that it is quite useless to assign students to groups and to tell them to discuss the content without giving them guidance on how to conduct their activities. Again it is difficult to accept or reject either format since research has not been conducted along these lines. It is possible, however, that another compromise may be suitable. Each cell could be provided with a number of formats with the option to choose one, adapt one, or construct a new format suitable to both partners.

Since the learning cell is a recent instructional innovation, it is not surprising to find it being compared to existing

methods. The following studies support the contention that the learning cell is as effective as those methods with which it has been compared.

Goldschmid (1971) compared the seminar (10-12 students), discussion (6-12 students), independent study, and the learning cell methods of instruction in a psychology course. There were no differences among the groups in regard to personality, overall grade point average, major, and previous number of psychology courses taken. Although there were no differences among groups on the final examination, the findings did indicate that "...the students in the learning cell group performed significantly better on an unannounced essay exam administered at the end of the course." (p. 4) The students also rated the learning cell method over the other three methods concerning overall satisfaction with each class meeting and again with the overall course evaluation.

In a study conducted by Alexander, Gur, Gur, and Patterson (1973), students in learning cells were compared to individual learners in a mathematics problem-solving task. Students in the learning cells scored higher on the criterion test than students who studied alone. Students in the learning cells were also less fatigued and showed more interest at the end of the study than those who studied individually. Torrance (1970) supports this finding. "At the end of the fourth task, students in dyads seemed to be going stronger than ever and to be having fun while those working alone seemed to be fatigued and ready to stop." (p. 393) Amaria, Biran, and Leith (1969) also compared learning

cells to individual learners. They reported that students in learning cells showed higher achievement than those students who studied individually for both heterogenous and homogenous pairs.

In a study by Dick (1965) it was discovered that there was no difference between learning cells and individuals on course examinations; however, when the final examination was re-administered a year later, the students in the learning cells scored higher than those who worked alone. Dick indicated that interaction may have been the reason for the longer retention. Additional support comes from Myers, Travers, and Sanford (1965). This study compared four learning conditions in learning a rote-memory task. Students were assigned a **teacher** role in a dyad, a pupil role in a dyad, dyads which had reverse roles, and self-instruction. The results showed that the students in the reverse role condition, the typical learning cell, scored about equally with the other conditions but they also maintained a higher degree of interest and attention during the three day experiment.

Implications for this Study

The previous review of the literature has suggested that the theoretical idea underlying the learning cell has been successfully applied to practical situations in education; however, the studies to date have been limited in their scope. All that can be reported is that: 1) learning cells are as effective as other instructional methods, 2) they can be used

in practically every discipline and grade level, and 3) students have an overall positive attitude toward the learning cell method of instruction.

It is difficult to study this particular method because of the infinite number of variables that may be present in any learning cell at any given time. However, there is a need to make some attempt to explore the dynamics of the learning cell to determine important variables relating to the preferences and concerns of the members of a learning cell.

Some of these dynamics and variables are:

DYNAMIC 1: PERCEIVED OUTPUT BY STUDENTS

First Variable: General Attitude

Is the learning cell a worthwhile instructional method?

Is learning more enjoyable because of the learning cell?

Should learning cells be used in more classes?

Second Variable: Effectiveness

Does the learning cell help better prepare students for class and examinations?

Does the learning cell help students better understand the content of the course?

DYNAMIC 2: INTERNAL ACTIVITIES

Third Variable: Interaction

Do students feel more comfortable raising questions in learning cells?

Do learning cells stimulate students to raise questions?

Do partners have any problem interacting with each other in the learning cell?

Do partners equally share the workload and contribute to the discussions in the learning cell?

Fourth Variable: Content Structure

Do partners in a learning cell prefer some sort of content structure to guide their discussions?

Fifth Variable: Process Structure

Do students prefer to change partners every so often?

How much time should be devoted to learning cell activities?

Does the learning cell become more effective over time?

Is there a particular method that learning cell partners prefer to use to structure their discussions?

DYNAMIC 3: COMPOSITION

Sixth Variable: Method of Pairing

Does the method of pairing students into learning cells make any difference?

Seventh Variable: Age

Does age difference between cell members make a difference?

Eighth Variable: Sex

Does sex difference between cell members make a difference?

Ninth Variable: Race

Does race difference between cell members make a difference?

By searching for the answers to these questions and any others that may appear, future users of learning cells will be able to utilize this instructional method more effectively.

CHAPTER III

DESIGN OF THE STUDY

Introduction

The primary purpose of this study was to provide data on the dynamics of the learning cell and to identify those particular dynamics that may either facilitate or hinder the learning cell's effectiveness in a formal educational setting. The study emphasized student attitudes related to their experiences in the learning cell. Chapter III presents a detailed description of the research design including: 1) population and sample, 2) treatment, 3) instrumentation, 4) pilot study, and 5) data analysis.

Population and Sample

The subjects participating in this study were students in an introductory psychology course at Oakland Community College. The sample was 32 students in a section of the course taught by Dr. Virginia Svagr during the fall semester, 1974. It was assumed that these students were representative of the population of community college students. This particular section was chosen instead of randomly drawing from the total number of sections since it presented certain advantages. 1) The instructor agreed to alter her teaching method for this study and provide class time for learning cell activities. 2) The class size was small enough to be manageable. 3) Working with only one class and one instructor greatly diminished communication and logistical

problems. 4) Subjects were required to participate in the study as part of the course requirement. 5) The heterogenous make-up of the class seemed desirable for collecting attitudinal data. Data on: 1) number of students in class, 2) range of ages, 3) race distribution, 4) sex distribution, 5) number of years of college, 6) previous courses taken in psychology, and 7) backgrounds or occupations, are found in Appendix A.

Treatment

The treatment used with the sample was divided into five phases. Each phase represents a different period of time in the semester.

Phase I - Week One

The section of the introductory psychology course chosen for this study met 1½ hours twice a week for 15 weeks. During the first class session, the instructor informed the students that they would be participating in a study conducted by the Department of Psychology at Oakland Community College during the last five weeks of the semester. This strategy was chosen in the hope that the students would feel more inclined to participate in a study conducted by Oakland Community College rather than by an outside agency. The instructor also gave the students a brief explanation of the learning cell and told them that their cooperation would be appreciated since the college was studying a new method of instruction.

Each student was given a personal data sheet to complete and return the same day. This was used to compile the data in

Appendix A. Finally, the instructor distributed the first of 13 weekly study guides (Appendix B). These were used by the members of the learning cells to structure their readings and discussions for the proceeding week's content. To reduce attrition, the experiment did not begin until the ninth week of the semester since students would not be able to drop the class after that time.

Phase II - Week Nine

During the ninth week of the semester, a list of students remaining in the course was compiled. Students on this list were then paired randomly, using a table of random numbers.

Phase III - Week Ten - Thirteen

In the tenth week of the semester the instructor announced the student pairings derived in Phase II and provided each student with suggested learning cell patterns (Appendix C) and a daily learning cell record (Appendix D). The students were also informed that during the fourteenth week they would be individually interviewed and that this interview would be strictly confidential.

During the four weeks of the learning cell activities the students met once during each class session. A typical week was broken down into the following time schedule. During the first class session the first hour was devoted to lecture followed by 30 minutes of learning cell activity. During the second class session the first 30 minutes were devoted to class discussion followed by 30 minutes of learning cell activity and

concluded with a 20 minute essay examination over the material presented during that week. The weekly essays were not graded, but instead, reviewed in terms of the students' understanding of the particular content taught that week. At the end of the four week period the students had spent approximately four hours in learning cell activities.

Phase IV - Week Thirteen

At the conclusion of the thirteenth week of class each student was given a learning cell questionnaire (Appendix E) to complete. These questionnaires were collected at the end of the class period and the students were asked to sign up for an interview during the following week.

Phase V - Week Fourteen

Personal interviews were conducted with each student. The interviews lasted about 45 minutes each and were audio-taped. Each student's learning cell questionnaire (Appendix E) was used during the interview to probe the reasons behind the self-reported attitudes.

Instrumentation

There were four instruments constructed for this study.

- 1) Weekly study guides (Appendix B).
- 2) Suggested learning cell patterns (Appendix C).
- 3) Daily learning cell record (Appendix D).
- 4) Learning cell questionnaire (Appendix E).

Weekly Study Guides

The guides were constructed by the instructor prior to the semester. They were distributed to each student one week prior to the assignment and were used for structuring the learning cells study and discussion for the following week. Each guide asked four questions: 1) Can you define these?, 2) Can you explain these?, 3) Can you compare these?, and 4) Do you know the significance of these? Each question gave a few examples from the assigned chapter and the students were encouraged to add additional items.

Suggested Learning Cell Patterns

This instrument was partially constructed from the review of the literature. Goldschmid (1971) reported the use of two methods of structuring learning cell activities. These methods were adapted to patterns one and two which can be found in Appendix C along with patterns three and four. Pattern three is an original method devised by the researcher. Pattern four is open-ended which allows the students in the learning cell to adapt any of the other three patterns or choose a new pattern of their liking. The purpose of these patterns was to provide the students with examples of studying in learning cells rather than letting them spend valuable time structuring their activities.

Daily Learning Cell Record

The purpose of this record was to help the students recall their learning cell experiences during the interview sessions.

Learning Cell Questionnaire

The purpose of this questionnaire was to provide a base of information regarding the students' attitudes toward the use of the learning cell method of instruction in a formal educational setting.

In order to formulate the statements contained in the questionnaire, it was necessary to determine the most appropriate factors to be considered. Specific objectives were written regarding concerns of learning cells compiled from the review of the literature. The statements in the questionnaire were arranged in the Likert (1932) format using the following five category response system: 1) strongly agree, 2) agree, 3) undecided, 4) disagree, and 5) strongly disagree. The "strongly agree" category denotes the most favorable response to the statements and the "strongly disagree" category represents the most unfavorable response to the statements. The statements were then used during the pilot study and as a result various items were revised for the final draft.

Pilot Study

Prior to conducting the study, a pilot study was conducted during the 1974 summer session at Oakland Community College. The purposes of this pilot study were to: 1) correct any administrative problems that might arise during the actual study, 2) determine whether the students understood the purpose and content of the instruments, 3) identify any factors or variables overlooked in the initial questionnaire and also test the wording of the statements, 4) determine the appropriate

length of time to conduct the in-depth interviews, and 5) revise instruments or procedures as required.

Data Analysis

The findings presented in Chapter IV of this study involved the use of two instruments: the learning cell questionnaire, and the in-depth interview.

As already noted, the learning cell questionnaire was completed at the conclusion of the thirteenth week of the semester. The questionnaires were then analyzed as to the actual number and percentage of students responding to each of the five statement categories for each question.

During the in-depth interview, the questionnaire of each student being interviewed was used to probe the reasons behind the particular responses. In this way, the particular dynamics and variables that may either facilitate or hinder the learning cells' effectiveness were identified.

Each interview was audio-taped and the responses were analyzed and reported for each statement. The findings are reported in Chapter IV.

CHAPTER IV

ANALYSIS OF THE DATA

Overview

A compilation of the findings of the study and discussion of the findings are reported in this chapter. The first part of the chapter will present findings related to the dynamics and variables identified in Chapter II. Data obtained from the learning cell questionnaire (Appendix E) and the personal interviews are the basis for the findings for each of the variables. The raw scores on each item on the questionnaire will be given showing the actual number and percentage of students responding to each category for that item. The categories are: SA = strongly agree, A = agree, U = undecided, D = disagree, and SD = strongly disagree. The daily learning cell record results will not be used in the findings or discussion due to the participants' lack of interest in keeping a daily record. The results of the personal interviews for each item will be reported in a narrative fashion.

The second part of the chapter will be devoted to the discussion of the findings for each dynamic and variable. Also included in this section will be a discussion of the instructor's attitudes toward learning cells.

Findings

DYNAMIC 1: PERCEIVED OUTPUT BY STUDENTS

There are two variables, general attitude and effectiveness for this dynamic.

First Variable: General Attitude Toward the Learning Cell.

The general attitude of the participants in the study toward the learning cell method of instruction was examined through questions 1, 7, 13, 15, 17, and 21.

QUESTION #1 - LEARNING CELLS SHOULD BE USED IN MORE CLASSES.

The results of the questionnaire were:

<u>4 (13%)</u>	<u>11 (34%)</u>	<u>9 (28%)</u>	<u>6 (19%)</u>	<u>2 (6%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 15 (47%) respondents definitely enjoyed the experience and would like other courses to use learning cells; 5 (16%) needed more experience to make a decision; 6 (19%) felt that it would depend on the type of course, and partner compatibility; and 6 (19%) felt that the experience did not benefit them at all.

QUESTION #7 - IN GENERAL THE LEARNING CELL WAS A WORTHWHILE EXPERIENCE FOR ME.

The results of the questionnaire were:

<u>8 (25%)</u>	<u>13 (41%)</u>	<u>5 (16%)</u>	<u>5 (16%)</u>	<u>1 (3%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 21 (66%) respondents felt that the learning cell was worthwhile since it was more effective in helping them to understand the content; 5 (16%) reported that it was beneficial at times; and 6 (19%) felt that it did not help them at all.

QUESTION #13 - LEARNING WAS MORE ENJOYABLE BECAUSE OF THE
LEARNING CELL.

The results of the questionnaire were:

<u>4 (13%)</u>	<u>11 (34%)</u>	<u>7 (22%)</u>	<u>8 (25%)</u>	<u>2 (6%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 15 (47%) respondents felt that the learning cell stimulated their interest in the course and provided a change of pace from the typical lecture; 4 (13%) reported that they enjoy learning no matter what method of instruction is utilized; 6 (19%) stated that both the learning cell and the instructor generated equal amounts of interest; and 6 (19%) would have preferred to work alone or with the instructor.

QUESTION #15 - OUR LEARNING CELL MET OUTSIDE OF CLASS AT LEAST
ONCE.

The results of the questionnaire were:

<u> </u>	<u>4 (13%)</u>	<u> </u>	<u>8 (25%)</u>	<u>20 (63%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 4 (13%) respondents did meet occasionally while the remaining 28 (88%) either had family, work, school, or distance that hindered them in meeting outside of class. However, 18 of the 28 or 64% stated that they would have attempted to meet if the various hindrances had not interfered.

QUESTION #17 - AFTER THIS EXPERIENCE I WOULD FORM A LEARNING CELL,
ON MY OWN IF THE INSTRUCTOR DID NOT USE THEM IN
CLASS.

The results of the questionnaire were:

$\frac{2 \text{ (6\%)}}{SA}$	$\frac{6 \text{ (19\%)}}{A}$	$\frac{10 \text{ (31\%)}}{U}$	$\frac{10 \text{ (31\%)}}{D}$	$\frac{4 \text{ (13\%)}}{SD}$
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The results of the personal interviews indicated that 8 (25%) respondents would actively pursue partners in future courses; 12 (38%) felt that they would not mind working in learning cells but were either too inhibited to seek a partner or would not have the time outside of class; 6 (19%) stated that it would depend on the type of class or people enrolled; and 6 (19%) reported that they learn just as effectively by themselves.

QUESTION #21 - I WOULD AVOID ENROLLING IN A SECTION OF A COURSE
IF THE INSTRUCTOR PLANNED TO USE LEARNING CELLS.

The results of the questionnaire were:

$\frac{3 \text{ (9\%)}}{SA}$	$\frac{3 \text{ (9\%)}}{A}$	$\frac{4 \text{ (13\%)}}{U}$	$\frac{11 \text{ (34\%)}}{D}$	$\frac{11 \text{ (34\%)}}{SD}$
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The results of the personal interviews indicated that 22 (69%) respondents would prefer learning cells in a course; 4 (13%) felt that it would depend on either the type of course and the instructor; and 6 (19%) would enroll if they could have the option of not participating in the learning cell.

Second Variable: Effectiveness

The attitude of the participants in the study toward the effectiveness of the learning cell in helping them gain a better understanding of the content and to prepare them for class and

examinations was examined through questions 5, 9, and 22.

QUESTION #5 - THE LEARNING CELL IMPROVED MY UNDERSTANDING OF THE CONTENT OF THE COURSE.

The results of the questionnaire were:

<u>2 (6%)</u>	<u>14 (44%)</u>	<u>8 (25%)</u>	<u>6 (19%)</u>	<u>2 (6%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 16 (50%) respondents thought that through discussions, new ideas and viewpoints were uncovered which enabled them to get a better understanding of the content; 4 (13%) felt that the lectures and book were as effective; 11 (34%) stated that they could have understood the content by themselves; and 1 (3%) did not care for psychology in the first place; therefore nothing was effective.

QUESTION #9 - BEING IN A LEARNING CELL CAUSED ME TO PREPARE FOR CLASS MORE THOROUGHLY.

The results of the questionnaire were:

<u>1 (3%)</u>	<u>7 (22%)</u>	<u>8 (25%)</u>	<u>10 (31%)</u>	<u>6 (19%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 6 (19%) respondents felt a responsibility to their partners to be prepared; 2 (6%) indicated that they prepared so that they would know what they were talking about; and 24 (75%) stated that they always prepare for class and that the learning cell did not cause them to do so.

QUESTION #22 - THE LEARNING CELL HELPED TO PREPARE ME FOR THE WEEKLY ESSAYS.

The results of the questionnaire were:

<u>SA</u>	<u>9 (28%)</u>	<u>14 (44%)</u>	<u>4 (13%)</u>	<u>5 (16%)</u>
	A	U	D	SD

The results of the personal interviews indicated that 9 (28%) respondents felt that the day-by-day interaction helped them to clarify the material that they would be examined on each week; 7 (22%) stated that a combination of the lectures, book, study guides, and learning cell helped to prepare them; 8 (25%) reported that they would have prepared anyway by themselves; and 8 (25%) did not think that they could make an honest judgment.

DYNAMIC 2: INTERNAL ACTIVITIES

There are three variables, interaction, content structure, and process structure for this dynamic.

Third Variable: Interaction

The attitude of the participants in the study toward their interactive experiences in the learning cell was examined through questions 3, 6, 8, 12, and 20.

QUESTION #3 - I FELT MORE COMFORTABLE RAISING QUESTIONS IN THE LEARNING CELL THAN IN FRONT OF THE WHOLE CLASS.

The results of the questionnaire were:

<u>6 (19%)</u>	<u>17 (53%)</u>	<u>2 (6%)</u>	<u>6 (19%)</u>	<u>1 (3%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 23 (72%) respondents felt that the intimacy of the learning cell reduced

their anxiety to raise questions which came from being either shy, embarrassed or nervous; 9 (28%) stated that they did not feel uncomfortable raising questions in any atmosphere.

QUESTION #6 - I WAS USUALLY UNCOMFORTABLE INTERACTING WITH MY PARTNER DURING THE LEARNING CELL SESSIONS.

The results of the questionnaire were:

<u>3 (9%)</u>	<u>1 (3%)</u>	<u>2 (6%)</u>	<u>19 (59%)</u>	<u>7 (22%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 24 (75%) respondents had little or no problem interacting with their partners; 5 (16%) stated that they were uncomfortable at the beginning but worked out any differences after a few sessions; and 3 (9%) said that there was a definite personality problem which affected the interaction.

QUESTION #8 - THE LEARNING CELL STIMULATED ME TO RAISE MORE QUESTIONS.

The results of the questionnaire were:

<u>4 (13%)</u>	<u>15 (47%)</u>	<u>6 (19%)</u>	<u>4 (13%)</u>	<u>3 (9%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 19 (59%) respondents were stimulated to raise questions due to the discussions with their partners; 6 (19%) could not honestly decide if the learning cell stimulated them; and 7 (22%) reported that they raise questions under any situation.

QUESTION #12 - MY PARTNER USUALLY DOMINATED OUR LEARNING CELL ACTIVITIES.

The results of the questionnaire were:

<u>1 (3%)</u>	<u>4 (13%)</u>	<u>4 (13%)</u>	<u>17 (53%)</u>	<u>6 (19%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 27 (84%) respondents felt that the discussions were equally divided during a session; and 5 (16%) reported that their partner dominated the conversation; however, this was acceptable to them since the partner knew more about the assignment than they did.

QUESTION #20 - THE RESPONSIBILITY IN MY LEARNING CELL WAS SHARED ABOUT EQUALLY.

The results of the questionnaire were:

<u>9 (28%)</u>	<u>17 (53%)</u>	<u>4 (13%)</u>	<u>1 (3%)</u>	<u>1 (3%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 26 (81%) respondents felt that the responsibility for researching questions and partaking in the discussions was shared equally; 4 (13%) thought that they did most of the work, but this did not bother them; and 2 (6%) felt that their partners did most of the work.

Fourth Variable: Content Structure

The attitude of the participants in the study toward the structure of the content employed to guide the learning cell discussions was examined through question 4.

QUESTION #4 - MY LEARNING CELL FOUND THE WEEKLY STUDY GUIDES TO BE IMPORTANT IN STRUCTURING OUR DISCUSSIONS IN THE LEARNING CELL.

The results of the questionnaire were:

<u>6 (19%)</u>	<u>17 (53%)</u>	<u>5 (16%)</u>	<u>4 (13%)</u>	<u> </u>
SA	A	U	D	SD

The results of the personal interviews indicated that 23 (72%) respondents found the guides to be very important in structuring their discussions; 4 (13%) reported that they used the guides occasionally; 2 (6%) stated that they went through the chapters in the book; and 3 (9%) indicated that they had their own method of studying but could see the usefulness of the guides for others.

Fifth Variable: Process Structure

The attitude of the participants in the study toward the structure of the total learning cell process was examined through questions 11, 16, 18, and 19.

QUESTION #11 - THE EFFECTIVENESS OF OUR LEARNING CELL GREW EACH WEEK.

The results of the questionnaire were:

<u>3 (9%)</u>	<u>10 (31%)</u>	<u>7 (22%)</u>	<u>10 (31%)</u>	<u>2 (6%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 13 (41%) respondents felt that their effectiveness improved, but it usually took about two or three learning cell sessions; 10 (31%) reported that they did not have enough time to make a judgement; 2 (6%) said that they became too friendly with their partners;

thus, the effectiveness decreased; and 7 (22%) said they got into a rut and stayed about the same.

QUESTION #16 - THE LEARNING CELLS TOOK TOO MUCH OF THE CLASS TIME EACH SESSION.

The results of the questionnaire were:

$\frac{2 (6\%)}{SA}$	$\frac{2 (6\%)}{A}$	$\frac{4 (13\%)}{U}$	$\frac{18 (56\%)}{D}$	$\frac{6 (19\%)}{SD}$
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The results of the personal interviews indicated that 24 (75%) respondents would have preferred more time in the learning cells; 4 (13%) thought that the allotted time was satisfactory; and 4 (13%) would have preferred not to have ever been in the learning cells.

QUESTION #18 - I THINK THAT WE SHOULD HAVE HAD THE OPPORTUNITY TO CHANGE PARTNERS AT LEAST ONCE DURING THE COURSE.

The results of the questionnaire were:

$\frac{7 (22\%)}{SA}$	$\frac{16 (50\%)}{A}$	$\frac{9 (28\%)}{U}$	$\frac{\quad}{D}$	$\frac{\quad}{SD}$
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The results of the personal interviews indicated that 27 (84%) respondents would have preferred to have had the opportunity to change partners if they desired; and 5 (16%) reported that it would make no difference to them.

QUESTION #19 - THE LEARNING CELL ACTIVITY SHOULD HAVE STARTED EARLIER IN THE SEMESTER.

The results of the questionnaire were:

$\frac{5 (16\%)}{SA}$	$\frac{20 (63\%)}{A}$	$\frac{4 (13\%)}{U}$	$\frac{2 (6\%)}{D}$	$\frac{1 (3\%)}{SD}$
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The results of the personal interviews indicated that 27 (84%) respondents would have preferred the learning cell activity to start earlier in the semester; 2 (6%) thought it could be used occasionally throughout the semester; and 3 (9%) felt that it should have never begun.

One further question dealing with process structure was not asked on the learning cell questionnaire (Appendix E) but was asked during the personal interviews. The question sought to find out which particular learning cell pattern (Appendix C) the members of the cell chose to follow. Virtually all of the cells chose option three which allowed them to construct their own format for structuring their discussions.

DYNAMIC 3: COMPOSITION

There are four variables, method of pairing, age, sex, and race for this dynamic.

Sixth Variable: Method of Pairing

The attitude of the participants in the study toward the method in which they were paired was examined through question 2.

QUESTION #2 - IF I WERE IN A LEARNING CELL AGAIN I WOULD PREFER TO CHOOSE MY OWN PARTNER.

The results of the questionnaire were:

<u>4 (13%)</u>	<u>7 (22%)</u>	<u>12 (38%)</u>	<u>6 (19%)</u>	<u>3 (9%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 11 (34%) respondents would have preferred to choose their own partner in order to work with someone they felt was compatible or had

something in common with them; 10 (31%) felt that it made no difference how a partner was chosen for them; 2 (6%) expressed a desire to have an option to change partners if they wanted to do so; and 9 (28%) preferred being paired with strangers since friends may discuss personal affairs thus defeating the purpose of learning cells.

Seventh Variable: Age

The attitude of the participants in the study toward the difference in age between partners was examined through question 14.

QUESTION #14 - IT IS IMPORTANT THAT LEARNING CELL PARTNERS BE ABOUT THE SAME AGE.

The results of the questionnaire were:

<u>1 (3%)</u>	<u>3 (9%)</u>	<u>7 (22%)</u>	<u>9 (28%)</u>	<u>12 (38%)</u>
SA	A	U	D	SD

The results of the personal interviews indicated that 28 (88%) respondents felt that age was not an important factor though it may be interesting to work with someone either older or younger to share their values and experiences; 4 (13%) reported that partners should be about the same age.

Eighth Variable: Sex

The attitude of the participants in the study toward the difference in sex between partners was examined through question 10.

QUESTION #10 - IF I COULD CHOOSE MY OWN PARTNER I WOULD PICK
SOMEONE OF MY OWN SEX.

The results of the questionnaire were:

$\frac{1}{SA}$	$\frac{1}{A}$	$\frac{16}{U}$	$\frac{10}{D}$	$\frac{4}{SD}$
(3%)	(3%)	(50%)	(31%)	(13%)

The results of the personal interviews indicated that 28 (88%) respondents did not feel that sex was an important factor; 2 (6%) preferred to work with members of the same sex; and 2 (6%) preferred working with those of the opposite sex.

Ninth Variable: Race

The question regarding race difference between partners was not asked on the learning cell questionnaire (Appendix E) since the population was totally white; however, the attitude of the participants in the study toward the difference in race was examined through the personal interviews. Of the respondents, 28 (88%) indicated that race would not make a difference; 2 (6%) were undecided; and 2 (6%) preferred to work with someone of their own race.

Discussion

DYNAMIC 1: PERCEIVED OUTPUT BY STUDENTS

First Variable: General Attitude

The findings of this study in regard to the participants attitude toward the learning cell infer that it is a satisfactory method of instruction. Those participants who were favorable toward the experience indicated that the main advantage of learning cells is to provide students with an opportunity to interact

with peers in a more open and informal educational setting. The data also showed that learning cells gave students more responsibility and an active role in the learning process. Discussions helped to generate questions and to clarify the content under examination. Personal factors such as getting to know and learn about others, more informal interaction with the instructor, and less instructor authoritarianism and student competition all aided in making the learning cell an enjoyable experience.

Those students who were hesitant about accepting the learning cell felt that it was a worthwhile experience but other factors must be considered. These factors or variables were: 1) the instructor's role and commitment, 2) the type of course, 3) partners compatibility, 4) structure of the course, and 5) how the learning cell was structured in the course. In other words, the learning cell cannot exist by itself in a formal educational setting. There must be integration and coordination between the cell and other variables and teaching methodologies employed to maximize its effectiveness.

Those students who expressed a negative attitude toward the learning cell were all strong individualists who felt that they learn more effectively by themselves and would prefer to work alone or with the instructor.

Second Variable: Effectiveness

The findings regarding the effectiveness of the learning cell in improving the students understanding of the content of the

course infer that it is an effective method; however, the learning cell is not an entity in itself. Even though interaction tends to bring more viewpoints to the surface; lectures, readings, and instructor effectiveness must all work together to maximize the effectiveness of the cells.

On the other hand, the findings do not support the contention that learning cells help to prepare students for class and examinations. A majority of respondents felt that they would prepare for class and exams even without the learning cell. It should be noted though that past studies (Alexander, Gur, Gur, and Patterson, 1973; Goldschmid, 1971) have shown that students working in learning cells perform better on examinations than those who have worked individually.

DYNAMIC 2: INTERNAL ACTIVITIES

Third Variable: Interaction

The findings regarding the interaction between learning cell partners infer that the members of a cell had little or no problem working together. In fact, the learning cell provided a more relaxed atmosphere for many students to raise questions thus relieving their anxieties to do the same in front of an entire class. Those who responded negatively to this aspect noted that they felt comfortable raising questions in any situation; thus, the learning cell afforded each person the opportunity to interact and question which is either absent in many educational settings or controlled by just a few individuals. Also, cell members were stimulated to raise more questions

regarding the material being covered due to the element of interaction.

The findings also infer that most learning cell partners equally share the workload and that they are able to adjust to individual differences in a short time.

Those few who indicated a negative response to the advantage of a one-to-one interaction situation usually reported that personality differences interfered with their progress.

Fourth Variable: Content Structure

The findings infer that a learning cell should be given some form of structure to guide discussions and activities. A majority of respondents indicated that they based their entire activities around the weekly study guides (Appendix B). The guides were constructed by the instructor and contained the important points for each weekly assignment. The respondents felt that the guides saved them considerable time by pinpointing the important material from the chapters in the textbook and the lectures, thus greatly reducing wasted time and effort in the learning cell. Those who felt that the guides were of little value stated that they preferred to guide their own studies by reviewing the chapters and lecture notes.

Fifth Variable: Process Structure

The findings regarding the process structure infer that time and flexibility are essential elements for the success of learning cells. Learning cell members should be given approximately three half-hour sessions to become adjusted. After this

time the members should have worked out any individual differences and begun to work together effectively. The respondents felt that after a period of three hours in the learning cell all members should have the option to either change partners, keep the same partner, or drop out of the cells and study individually. This would help those individuals who have not adjusted to their partners or the learning cell method in general. It was noted that changing partners may be beneficial from the standpoint of getting to know more people and sharing their experiences and ideas; however, this may be detrimental in the long run. It could take another $1\frac{1}{2}$ hours to become adjusted to another partner thereby wasting valuable time.

The respondents also indicated that they would prefer more time in the learning cells. For a typical three hour class they recommended one hour of lecture followed by $1\frac{1}{2}$ hours of learning cell activity and concluding with a half-hour of open discussion with the entire class.

The instructor should also play a specific role during the learning cell sessions. The respondents felt that it is important that the instructor circulate among the cells and answer any questions that may be causing problems. This would also give the students a chance to get to know the instructor on a more personal basis as well as using him/her as a resource person.

Regarding the specific type of structure employed by the learning cell to facilitate discussions, the majority of respondents indicated that each cell chose its own method

acceptable to both partners. However, the respondents thought that examples of structuring discussions would be useful from the standpoint of generating a discussion on the type of format to use.

Those who responded negatively toward the process structure would have preferred to have studied alone in the first place. As already mentioned, this option should be made available to all students after a short period of time.

DYNAMIC 3: COMPOSITION

Sixth Variable: Method of Pairing

The findings regarding the method of pairing students for learning cells infer that the random method is acceptable. Students in the learning cells that indicated a preference for random pairing over self-selection felt that friends would tend to discuss only personal affairs, and differing viewpoints might not be brought up. The respondents also felt that this method provided them an opportunity to make new friends and to learn more about others values, ideas, and interests. Those who preferred to select their own partners stated that they would work better with someone they knew with whom they felt compatible. Most of the respondents reported that they got along well with their respective partners.

Seventh Variable: Age

The findings regarding the difference of ages between learning cell partners infer that age does not make a difference.

Those respondents who indicated this explained that it would make no difference if their partner was either the same age, older, or younger. It should be noted that a few individuals felt that it might be interesting to work with someone older or younger in order to see how values, ideas and experiences differ. Those who disagreed with the majority stated that they would work better with someone of their own age who would have the same values and experiences.

Eighth Variable: Sex

The findings regarding the difference of sex between learning cell partners infer that sex does not make a difference. Those respondents who felt this way indicated that it makes no difference if their partner is the same or opposite sex. Those who differed with this opinion either preferred to work with members of the same sex or opposite sex.

Ninth Variable: Race

The findings regarding the difference of race between cell members is inconclusive. Practically all of the respondents felt that race would make no difference, but since the class consisted of all white members, there was no experience upon which to base judgement.

Instructor Perceptions of the Learning Cell

The instructor was interviewed in order to obtain data on the learning cell from her perspective. She indicated that the learning cells should have begun earlier in the semester since

most of the students were too accustomed to the established instructional method and had a difficult time making the transition. If she were to use learning cells in future classes they would begin at the outset of the course. She did report that the learning cell changed her role of instructor from a lecturer and class discussion leader to more of a manager or organizer of the instruction. The nature of the study forced her to structure the course, her time, and the content. As a result she was released from her regular duty of lecturing and more responsibility was put on the students for their own learning. This released time gave her the opportunity to work more closely with the students, (to learn more about the students in general,) and to identify those having problems.

She felt that a majority of the students enjoyed the learning cells since they were given the opportunity to discuss and question the material being studied; however, there were a few students who were having problems adjusting to their partners. They indicated that they would like to change partners or work individually.

On an overall basis she felt that the students seemed better prepared for class and that the weekly essays and final examinations were of a better quality than those of previous courses, but she did not feel that this could be attributed to the learning cell alone. Other factors such as the quality of student and the identification of the content objectives may have influenced the student's performance.

There were some minor problems encountered during the study

and these usually dealt with time and absenteeism. The instructor indicated that periodically the lectures or class discussions were quite stimulating and the students would have preferred to continue with them rather than breaking into learning cells. Also, from time to time, students would be absent from class and due to the structure of the study, were forced to work by themselves. She felt that more flexibility regarding both the amount of time spent in learning cells and the opportunity to work with others would have helped to overcome these problems. In other words, there should not be a strict adherence to the amount of time spent in learning cells each class session, and if a student's partner happens to be absent on any particular day, he/she should have the chance to work with another student or learning cell.

Summary

The results of the findings indicate that the learning cell is a worthwhile method of instruction. It is effective from the standpoint of helping students gain a better understanding of the content of the course; however, the findings are inconclusive as to whether the learning cell actually better prepares students for class and examinations.

The learning cell provides students with more opportunities to interact with peers and the instructor, and usually only a small amount of time is needed for partners to adjust to each other. Method of pairing along with the variables of age, sex, and race difference between partners, seems to make little

difference; however, students would like an opportunity to change partners.

The findings also indicate that learning cells need an outline of important points of the content to structure their discussions. Time must be provided for partners to adjust to individual differences and the learning cell in general, together with providing those who would prefer to work individually an option to do so.

The learning cell also caused the instructor to change her role from a conveyor of information to a manager of the learning situation. It gave her an opportunity to work more closely with students and to learn more about them in general. She had an overall positive attitude toward the experience and would only recommend beginning learning cells at the outset of the course and building in more flexibility regarding time spent in the learning cells and providing options for those who either cannot adjust to their partners or prefer to work alone.

Chapter V will present an overview of the study as well as the conclusions, implications, and recommendations for further research.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study was to collect data on the dynamics of the learning cell and to identify those particular dynamics that may either facilitate or hinder the learning cell's effectiveness in a formal educational setting. Specifically, the study attempted to provide data on three particular dynamics: 1) perceived output by students, 2) internal activities, and 3) composition. Data was collected via a questionnaire and interview of students who had participated in the learning cell activities in order to: 1) determine their attitudes regarding the learning cell dynamics, and 2) identify the reasons underlying these attitudes.

The treatment consisted of structuring a community college course in psychology to include lectures, readings in the textbook, large group discussion, and learning cell activities. During the study, 32 students were randomly paired into 16 learning cells. For a typical week, the students were responsible for reading weekly assignments which were supplemented with a one hour lecture followed by a half-hour learning cell activity. Following the learning cell activity was a half-hour open discussion with the total class after which the students spent another half-hour in learning cells.

Several instruments were constructed to guide the students in organizing and discussing the material. The weekly study

guides (Appendix B) were constructed by the instructor and contained the important points of that particular weekly assignment. These were used to generate topics of discussion in the learning cell. The students were also given suggested learning cell patterns (Appendix C) which provided them with various examples of how to structure their discussions.

After four weeks, or approximately four hours of learning cell activity, the students completed a learning cell questionnaire (Appendix E) which was used to collect a base of information regarding the students' attitudes toward the learning cell. Personal interviews were then conducted with each student. The interviews lasted about 45 minutes each and were audio-taped. Each student's learning cell questionnaire was used during the interview to probe the reasons behind the self-reported attitudes.

Conclusions

The following conclusions regarding learning cell dynamics may be drawn from the expressed attitudes of the participants of the study.

DYNAMIC 1: PERCEIVED OUTPUT BY STUDENTS

Conclusion 1: THE LEARNING CELL IS AN EFFECTIVE METHOD OF HELPING STUDENTS GAIN A BETTER UNDERSTANDING OF THE MATERIAL BEING STUDIED AND SHOULD BE USED IN MORE CLASSES.

This conclusion was reached as a result of responses to questions 1, 5, 7, 13, 17, and 21 and supporting interview data. The students felt that the learning cell provided them an opportunity to interact with their peers and the instructor. The students

indicated that through the learning cell discussion, new or opposing viewpoints or perspectives would emerge which would result in a better understanding of the issues being discussed. The students also reported that they could play a more active role in the learning process due to a chance to discuss and question certain elements of the course content.

Conclusion 2: LEARNING CELLS DO NOT INCREASE STUDENT
 MOTIVATION TO PREPARE FOR CLASS AND
 EXAMINATIONS.

This conclusion was reached as a result of the responses to questions 9 and 22 and supporting interview data. Even though the students felt a responsibility to their respective partners and to themselves, they reported that they prepare for class and examinations anyway and the learning cell did not cause them to do so anymore than they would have ordinarily.

Conclusion 3: THE LEARNING CELL IS NOT AN APPROPRIATE
 METHOD OF INSTRUCTION FOR 20% OF THE
 STUDENTS SAMPLED.

This conclusion was reached as a result of the responses to questions 1, 2, 3, 5, 9, 16, 17, 19, 21, and 22 and supporting interview data. Those students who expressed a negative attitude toward learning cells stated that they preferred to study their own way since they learn more effectively by themselves.

Conclusion 4: THE PERCEIVED SUCCESS OF THE LEARNING
 CELL IS RELATED TO HOW IT IS INTEGRATED
 WITH OTHER INSTRUCTIONAL METHODS.

This conclusion was reached as a result of the responses to questions 1, 13, and 22 and supporting interview data. The

students reported that the success of the learning cell depends on how it is structured in the course. They felt that the learning cell was not an entity in itself; therefore, it must be integrated with other resources such as readings and study guides along with instructional methodologies such as lectures and discussions to maximize the effectiveness of the learning cell.

DYNAMIC 2: INTERNAL ACTIVITIES

Conclusion 5: STUDENTS FEEL LESS ANXIETY WHEN ASKING QUESTIONS IN A LEARNING CELL.

This conclusion was reached as a result of the responses to question 3 and supporting interview data. The students felt that the intimacy of the learning cell reduced their anxieties to raise questions; thus, they were able to participate actively in the learning cell by openly discussing and questioning the material being studied.

Conclusion 6: STUDY GUIDES ARE NEEDED IN THE LEARNING CELL TO SAVE TIME.

This conclusion was reached as a result of the responses to question 4 and supporting interview data. The students felt that the weekly study guides (Appendix B), by pinpointing the objectives of the lesson, saved them considerable time and guesswork in identifying the major points for discussion. The students also indicated that the guides were useful for reviewing previous content prior to examinations.

Conclusion 7: AN INSTRUCTOR SHOULD BE AVAILABLE DURING LEARNING CELL ACTIVITIES TO ANSWER ANY QUESTIONS THAT MAY ARISE.

This conclusion was reached as a result of the responses to questions 1, 4, 13, 16, 17, 18, and 21 and supporting interview data. The students felt that the instructor should make himself available to the learning cells during their activities in order to answer questions that may arise. They indicated that this would also help the students and instructor to know each other on a more individual basis.

Conclusion 8: LEARNING CELL PARTNERS DO NOT OBJECT TO THE INTENSIVE ONE-TO-ONE INTERACTION THAT THE LEARNING CELL DEMANDS AND THEY FEEL A RESPONSIBILITY TO EACH OTHER TO SHARE THE WORKLOAD AND DISCUSSION.

This conclusion was reached as a result of the responses to questions 3, 6, 12, and 20 and supporting interview data. Students reported that they felt comfortable with their partners and easily adjusted to individual differences over a short period of time, usually an hour or so. The students also indicated that they shared the workload and discussion with their partners since they felt that they had a responsibility to fulfill.

Conclusion 9: THE AMOUNT OF TIME SPENT IN VARIOUS LEARNING CELL ACTIVITIES MUST BE FLEXIBLE TO ACCOMODATE SCHEDULE FACTORS AND OTHER INDIVIDUAL DIFFERENCES.

This conclusion was reached as a result of the responses to questions 1 thru 22 and supporting interview data. The students felt that the amount of time spent in learning cell

activities should be flexible. If the lecture or discussion is exceptionally stimulating, they would prefer not to break-up into learning cells at a specific point in time. On the other hand, if the lecture or discussion is not productive, the students should be able to work in the learning cells. The students indicated that learning cell partners should be given approximately $1\frac{1}{2}$ hours to adjust to their respective partners. They also indicated that learning cell members should be given a chance to change partners if they desire or to drop out of the activity and study individually.

Conclusion 10: LEARNING CELL PARTNERS PREFER TO CHOOSE THEIR OWN METHOD OF STRUCTURING THEIR DISCUSSIONS.

This conclusion was reached as a result of the responses to the personal interviews. The students felt that the suggested learning cell patterns (Appendix C) were beneficial from the standpoint of generating a discussion on the type of format to use. Virtually all of the learning cells chose pattern three which suggested that the partners agree upon the content that needed clarification and conduct an open discussion without either partner being assigned a particular role.

DYNAMIC 3: COMPOSITION

Conclusion 11: PAIRING STUDENTS RANDOMLY FOR LEARNING CELLS IS AN ACCEPTABLE METHOD.

This conclusion was reached as a result of the responses to question 2 and supporting interview data. The students reported that it made little difference to them how their partner was chosen. In fact, some preferred to be paired with strangers

since friends may discuss personal affairs thus defeating the purpose of the learning cell.

Conclusion 12: DIFFERENCE IN PARTNER'S AGE, SEX, OR
 RACE MAKES LITTLE DIFFERENCE TO STUDENTS
 IN LEARNING CELLS.

This conclusion was reached as a result of the responses to questions 10 and 14 and supporting interview data. Most students felt that these three variables made little or no difference to the effectiveness of the learning cell.

Implications of the Study

It was the purpose of this study to explore the dynamics of the learning cell and to identify those particular dynamics that may either facilitate or hinder the effectiveness of the learning cell in a formal educational setting. Previous literature regarding the theoretical idea underlying the learning cell (Moore and Anderson, 1969; Davies, 1966; Torrance, 1970; Bruner, 1968) along with previous research on the learning cell (Kingsbury, 1968; Goldschmid, 1971; Alexander, Gur, Gur, and Patterson, 1973) have provided evidence that the learning cell can be useful in a formal educational setting. The previous studies have only been able to report that the learning cell is as effective as other instructional methods; cells can be used in practically every discipline; and students have an overall positive attitude toward this method of instruction. The conclusions of this study have several more implications for potential users of the learning cell.

In keeping with Moore and Anderson's (1969) four principles for designing a clarifying environment discussed in Chapter II,

teachers using the learning cell can provide their students with a greater opportunity to interact with their peers and instructor in a more relaxed atmosphere. Not only will students be able to discuss and question the material being studied, but they will be able to look at other views and perspectives for any given topic.

Furthermore, if future users of the learning cell desire to upgrade the quality of student performance, the learning cell may be an appropriate method. Students in this study indicated that through their discussions in the learning cells they were able to understand the material better. Even though a conclusion of this study was that students are not more motivated to prepare for examinations due to their learning cell activities, Alexander, Gur, Gur, and Patterson (1973) and Goldschmid (1971) have proven that students working in learning cells perform better on examinations than those who have worked individually.

A major implication for future users of the learning cell concerns the role that the user must assume. First, the instructor should carefully structure the course so that other instructional resources and methodologies such as readings from textbooks, lectures, discussions, and other resources compliment each other. The learning cell is not an entity in itself and must be integrated with other elements of the course.

Second, specific objectives of the course content must be defined and made known to the students. These objectives should be used by the learning cell partners as guides for their discussions.

Third, the instructor should build flexibility in terms of time and options into the overall structure of the learning cell. Specific amounts of time should be set aside for learning cell activities; however, if a particular lecture or class discussion seems to be stimulating to the students, the learning cell activities for that day may be reduced or eliminated. Time for learning cell activities should also vary depending upon the complexity of the material being discussed. Students should also be given time to adjust to the learning cell in general and to their respective partners.

Options to change partners or drop out of the learning cell activity should be provided to students who may either be having problems interacting with their respective partners or would prefer to work alone. Also, if there is negative student reaction to the learning cell resulting in low performance, other instructional methods should be utilized. The learning cell is not an instructional panacea for which all students are suited. Each student has his own preferred learning style, and this should be respected and accommodated when possible and appropriate.

Fourth, the instructor should not be concerned about the method of pairing students. This study found that how partners were selected was not of concern to the students. Other variables such as age, sex, and race difference between partners made little difference to students in terms of their partner selection.

Finally, the role of the instructor in the classroom must

change if he chooses to use the learning cell. Instead of being a primary conveyor of information the instructor must be a manager of the learning situation. It becomes his responsibility to oversee learning cell activities and make himself available to the learning cells to answer any questions that may arise. Both the instructor and students have an opportunity to learn more about each other, and the instructor can identify those students who are having the most difficulty with the material being studied.

The implications of this study are limited by the nature of the data collected. However, these implications should encourage further research into the learning cell method of instruction and its other possible applications.

Implications for Further Research

As a result of this study, several variables regarding the dynamics of the learning cell have been identified which warrant further research.

1. Since the present study only explored the dynamics of the learning cell with a small psychology class in a community college, the study should be replicated in other classes and types of educational institutions such as elementary, secondary, professional, business, and industry schools.
2. A second study could compare the dynamics of the learn-cell in a class of over 100 students with the findings of this study in order to determine if class size

influences the dynamics of the learning cell.

3. A third study should examine whether the learning cell is more or less effective for any particular level of cognitive learning. Gagne (1968) identified eight levels of learning on a hierarchical structure. A study should center around whether the learning cell is effective for any particular level of learning; or is suited for all levels; or, how the learning cell can be managed or structured to be effective at all levels or any one level of learning.
4. A fourth consideration for research should deal with the acceptance of the learning cell by students. A technique could be developed or designed to identify those who are suited for learning cells and those who are not.
5. A fifth area of research could compare student attitude toward the learning cell with student performance. Do those students who indicate a favorable attitude toward the learning cell perform adequately or poorly? Conversely, how do those students who indicate a less than favorable attitude perform? Is the learning cell beneficial to students who perform adequately yet indicate a negative attitude toward it, or is the student's performance due to other variables?
6. A sixth area for future research should concern itself with instructor attitudes toward the learning cell. Are instructors willing to change their role and adopt

the learning cell? Does the learning cell change the instructor's perception of his role, of students, and of instruction in general?

7. Another area of interest which would be beneficial to learning cell research is identifying how the learning cell fits into the instructional process. What are other ways that the learning cell can be used in instruction? Can the learning cell be used as a prescriptive method for certain individuals? What are the essential elements needed for the learning cell to be effective? That is, how many elements such as readings, lectures, group discussions, instructor time, and/or how much of each of these elements or combinations are needed for a learning cell to be effective?
8. An eighth area of study could examine the day-by-day activities of a learning cell. An attempt should be made to identify just what happens during a learning cell session and to also study the learning cell over time to determine the type and degree of change it undergoes. This could be accomplished through several methods such as videotaping or filming the learning cell activities for future examination, personal observation of the learning cells during their activities, or interviews with the learning cell members on a day-by-day basis.

The present study, along with previous research into the

learning cell method of instruction, should be regarded as only first and tentative steps toward a more complete understanding. Hopefully, further research will lead to improvement of the learning cell and improve the quality of instruction.

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APPENDICES

APPENDIX A

CLASS COMPOSITION DATA

CLASS COMPOSITION DATA

DYAD	AGE	RACE	SEX	NUMBER OF YEARS OF COLLEGE		PREVIOUS COURSES IN PSYCHOLOGY		OCCUPATION
1	26	C	MALE	0	0	0	0	BUILDER
	18	C	MALE	0	0	0	0	SALESCLERK
2	18	C	MALE	0	0	0	0	STUDENT
	27	C	MALE	1	1	0	0	CIVIL SERVICE
3	18	C	MALE	0	0	1	0	STUDENT
	19	C	FEMALE	0	0	0	0	DIETARY AIDE
4	28	C	FEMALE	0	0	0	0	HOUSEWIFE
	36	C	FEMALE	0	0	0	0	HOUSEWIFE
5	22	C	MALE	0	0	0	0	HEALTH INST.
	20	C	MALE	0	0	0	0	ARTIST
6	19	C	FEMALE	0	0	0	0	WAITRESS
	60	C	FEMALE	0	0	0	0	HOUSEWIFE
7	19	C	MALE	0	0	0	0	STUDENT
	17	C	FEMALE	0	0	0	0	STUDENT
8	18	C	MALE	0	0	0	0	STUDENT
	45	C	FEMALE	0	0	2	2	HOUSEWIFE

CLASS COMPOSITION DATA

DYAD	AGE	RACE	SEX	NUMBER OF		PREVIOUS	OCCUPATION
				YEARS OF	COLLEGE	COURSES IN	
						PSYCHOLOGY	
9	19 24	C C	FEMALE FEMALE	0 0	0 0	0 0	STUDENT LPN
10	23 38	C C	MALE FEMALE	0 0	0 0	0 0	STUDENT HOUSEWIFE
11	31 18	C C	FEMALE FEMALE	0 0	0 0	0 0	PHARMACY CLERK SALESCLERK
12	18 51	C C	MALE FEMALE	0 0	0 0	0 0	STUDENT STUDENT
13	18 18	C C	FEMALE MALE	0 0	0 0	0 1	STUDENT STUDENT
14	20 24	C C	MALE MALE	0 2	0 2	0 1	POSTAL CLERK FACTORY WORKER
15	20 19	C C	MALE MALE	0 0	0 0	0 0	POSTAL CLERK JANITOR
16	21 19	C C	FEMALE MALE	0 0	0 0	0 0	STUDENT STUDENT

APPENDIX B

WEEKLY STUDY GUIDES

WEEKLY STUDY GUIDE

Chapter 10

I. CAN YOU DEFINE THESE?

1. Motive
2. Biological Drive
3. Incentive Object
4. Homeostasis

II. CAN YOU EXPLAIN THESE?

1. Theory of self-actualization
2. Functional autonomy
3. Does a need always lead to drive stimuli
4. Motive for affiliation
5. Achievement motive

III. CAN YOU COMPARE THESE?

1. Ordinary sleep and paradoxical sleep
2. Preconventional level, conventional level, and the postconventional level of moral development
3. Cognitive dissonance and cognitive consonance
4. An aroused motive and a potential motive

IV. DO YOU KNOW THE SIGNIFICANCE OF THESE?

1. Behavior stemming from the affiliation motive
2. Being the first born in relation to achievement motive
3. Having our basic stimulus needs being satisfied
4. Unconscious motives
5. Rapid eye movement in sleep
6. The drive sequence

WEEKLY STUDY GUIDE

Chapter 11

I. CAN YOU DEFINE THESE?

1. Frustration
2. External standards
3. Internal standards
4. Conflict

II. CAN YOU EXPLAIN THESE?

1. The relative nature of frustration
2. Achievement versus affiliation
3. Effects of frustration and conflict
4. Defense mechanisms
5. Regression

III. CAN YOU COMPARE THESE?

1. Approach and avoidance conflicts
2. Gradients of approach and avoidance
3. Direct aggression and displaced aggression
4. Normal and abnormal personality
5. Anxiety reaction and phobic reaction
6. Obsessive and compulsive reaction

IV. DO YOU KNOW THE SIGNIFICANCE OF THESE?

1. The complete absence of anxiety
2. Stress beyond the threshold for tolerance
3. Having the ability to function successfully despite frustrations and conflicts
4. Depression and apathy

WEEKLY STUDY GUIDE

Chapter 12

I. CAN YOU DEFINE THESE?

1. Personality
2. Three levels of consciousness
3. Free association
4. Inferiority complex

II. CAN YOU EXPLAIN THESE?

1. Personality hierarchy
2. Inferiority complex as explained by Adler
3. Concept of phenomenal self
4. Free association as developed by Freud
5. Group therapy
6. Behavior therapy
7. Resistance
8. Transference

III. CAN YOU COMPARE THESE?

1. The id, ego, and superego
2. Introvert and extrovert (Jung's theory)
3. Social learning theories and psychoanalytic theory
4. Roger's self theory and psychoanalytic theory

IV. DO YOU KNOW THE SIGNIFICANCE OF THESE?

1. The superego as conceived by Freud
2. Ego development
3. Insight

WEEKLY STUDY GUIDE

Chapter 14

I. CAN YOU DEFINE THESE?

1. Four requirements of a formal psychological test
2. Mental age
3. Chronological age
4. Intelligence

II. CAN YOU EXPLAIN THESE?

1. The method used to compute a child's I.Q.
2. Importance of heredity
3. Importance of environment
4. Group test
5. Individual test

III. CAN YOU COMPARE THESE?

1. Aptitude tests and achievement tests
2. Stanford-Binet test and Wechsler test
3. Objective and projective tests
4. Group test and individual test

IV. DO YOU KNOW THE SIGNIFICANCE OF THESE?

1. Environment on I.Q.
2. MMPI test
3. Heredity on I.Q.
4. Of the relationship of environment and heredity
5. General factor in intelligence

APPENDIX C

SUGGESTED LEARNING CELL PATTERNS

SUGGESTED LEARNING CELL PATTERNS

It is important that each learning cell establish a pattern or method of working together. Four options are explained below. Each cell should agree upon one of these options before starting a learning cell session. After choosing a pattern use the weekly study guides to structure your learning cell activities. You may change patterns as you wish.

OPTIONS:

1. One student asks his/her partner a question. The partner responds and the questioner gives feedback. Then the partners change roles and proceed as before. This process is continued until both partners feel they have mastered the content.
2. During the first few minutes of the learning cell session, the partners divide the assigned content in half. For the first half of the remaining time one person explains the major points of his/her assigned content and interacts with the partner for clarification. Partners reverse their roles for the remaining time.
3. Partners agree upon content that needs clarification or review. They hold a discussion without either partner being assigned a particular role.
4. Partners may invent a new pattern or adapt one of the above.

APPENDIX D

DAILY LEARNING CELL RECORD

DAILY LEARNING CELL RECORD

Would you please complete this record after each learning cell session. The purpose of this record is to serve as a reminder of your learning cell experiences over the next four weeks. The completed record can be used during the interview session on the following week. This record will not be collected; therefore, it is strictly confidential.

1. What did you like most about the learning cell activity today?
2. What did you like least about the learning cell activity today?
3. What changes would you recommend to improve those dislikes recorded under question number two?

APPENDIX E

LEARNING CELL QUESTIONNAIRE

LEARNING CELL QUESTIONNAIRE

NAME _____

Please be frank and honest in responding to each of the following items. The information you provide will be the most important factor in determining the future use of learning cells. This information will be kept confidential by the researcher. Please answer each item.

KEY: SA = you strongly agree
 A = you agree
 U = you are undecided
 D = you disagree
 SD = you strongly disagree

- | | | | | | |
|--|-----------|----------|----------|----------|-----------|
| 1. Learning cells should be used in more classes. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |
| 2. If I were in a learning cell again I would prefer to choose my own partner. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |
| 3. I felt more comfortable raising questions in the learning cell than in front of the whole class. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |
| 4. My learning cell found the weekly study guides to be important in structuring our discussions in the learning cell. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |
| 5. The learning cell improved my understanding of the content of the course. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |
| 6. I was usually uncomfortable interacting with my partner during the learning cell sessions. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |
| 7. In general the learning cell was a worthwhile experience for me. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |
| 8. The learning cell stimulated me to raise more questions. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |
| 9. Being in a learning cell caused me to prepare for class more thoroughly. | <u>SA</u> | <u>A</u> | <u>U</u> | <u>D</u> | <u>SD</u> |

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|---|-----------------|----------------|----------------|----------------|-----------------|
| 10. If I could choose my own partner I would pick someone of my own sex. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 11. The effectiveness of our learning cell grew each week. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 12. My partner usually dominated our learning cell activities. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 13. Learning was more enjoyable because of the learning cell. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 14. It is important that learning cell partners be about the same age. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 15. Our learning cell met outside of class at least once. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 16. The learning cells took too much of the class time each session. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 17. After this experience I would form a learning cell on my own if the instructor did not use them in class. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 18. I think we should have had the opportunity to change partners at least once during the course. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 19. The learning cell activity should have started earlier in the semester. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 20. The responsibility in my learning cell was shared about equally. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 21. I would avoid enrolling in a section of a course if the instructor planned to use learning cells. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 22. The learning cell helped to prepare me for the weekly essays. | $\overline{SA}$ | $\overline{A}$ | $\overline{U}$ | $\overline{D}$ | $\overline{SD}$ |
| 23. Any further comments you have regarding the learning cell will be appreciated. | | | | | |

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