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ABSTRACT

This monograph contains two papers that examine the importance of learning styles and discuss whether teaching styles should be matched to learning styles. The first paper, "The Matching of Learning Styles to Teaching during Teacher Education (Theory into Practice): A Preliminary Study," by A. FitzGibbon and others, discusses a research project in which student teachers had to determine the learning styles of their students using the Kolb Learning Styles Inventory, and design and implement a lesson in which the four phases of the Kolb Learning Cycle were included. Student teachers indicated that they would examine the learning styles of their students in the future. They felt that learning styles did not have to be matched to teaching style but that there should be variety in instruction. When the learning styles of the student teachers themselves were considered, it was found that "divergers" reported least change in teaching style and "convergers" claimed to have changed their role more than any other group. The second paper is an example of a student report by Charlotte L. Callaghan, titled "Learning and Teaching Styles in the Classroom." It presents a second year French lesson which included experiencing, examining, explaining, and applying. The student teacher concluded that the lesson took into consideration students' learning styles and maintained students' interest and motivation, but was very time consuming to prepare. (Contains 25 references.) (JDD)

EXPERIENCE VERSUS THEORY IN TEACHER EDUCATION

I
The Matching of Learning Styles to Teaching during Teacher Education (Theory into Practice)

A Preliminary Study

by

A. FitzGibbon J. Heywood L.A. Cameron

II
Learning and Teaching Styles in the Classroom

by

Charlotte L Callaghan

RESEARCH IN TEACHER EDUCATION MONOGRAPH SERIES, NO. 1/91, DEPARTMENT OF TEACHER EDUCATION, UNIVERSITY OF DUBLIN

Introduction.

The idea that cognitive learning style influences performance has been on the agenda of higher education for many years (Lavin,1967). This arises from the view that we have preferred ways (dispositions) of organizing what we see, remember and think about (Messick, 1976) or different styles of conceptualization and patterning activities which may be the most important characteristics of an individual (Tyler, 1978).

Perhaps the best known learning style is that which Guilford highlighted in his research on intelligence related to creativity. It is the disposition toward divergent (as opposed to convergent) thinking (Guilford, 1954). In the United States the importance of this concept in school learning was highlighted by the studies of Getzels and Jackson (1962). In Britain Hudson worried the science and engineering professors when as a result of pencil and paper tests he argued that the more creative sixth-formers (16-18 years of age) were likely to be those studying to the humanities only for entry to University in those subjects (Hudson, 1966). One inference made at the time was that since scientists and engineers may be lacking in creativity (even though this was a misinterpretation of the implications of divergent thinking) this might be a contributory factor to Britain's poor performance in engineering design (Gregory, 1972). But creativity is inherent in both convergent and divergent styles of thinking and Whitfield (1975) demonstrated the need for both in the solution of engineering problems. Divergers often appear more creative because they have skill in juxtaposing discrete factors in more speculative ways then convergers. There can be no doubt, though, that Hudson's findings encouraged the development of project work which enabled students to exercise a wide variety of skills including those often ascribed to divergent thinking in university studies which at that time was in an embryo state (Heywood, 1969).

At school level there was concern that the teaching tended to encourage convergent thinking and thereby to reward those with a preference for convergent thinking (See for example Heywood, 1982. Vernon, 1969). If this is true it is important that teachers should recognize this to be the case. In its turn it would imply that teachers should be aware not only of the learning styles of their students but of their own.

Other styles which have attracted attention are the field dependent/independent dimension, and the depth/surface. Witkin (1976) suggested that individual dispositions toward an individuals perception of his/her environment lie on a continuum, the polar ends of which he called field-dependent and field-independent. Those who are field-dependent look at the world in a global way, while those are field-independent see it analytically. The reactions of the field-dependent person to people, places and events are undifferentiated and complex whereas, the person who is field-independent does not associate the events (or objects of perception) in the environment with the background of that environment.

Several investigators including Witkin (1976) have claimed that an individuals location on the continuum between the two poles contributes to academic choice, success and vocational preference. Field-dependent persons require their learning to have more structure, direction and feed-back than field-independent ones, who tend to dislike collaborative learning. This would explain the everyday experience of teachers who find that some students who do not like group work are nevertheless good at academically analytical work, and it would reinforce the view that teachers should have a knowledge of the underlying preferences which their students have for learning.

One style which has provoked controversy in the higher education community is the depth/surface dimension which has been much studied by an Anglo-Scandinavian group of research workers in higher education (Marton, Hounsell and Entwistle, 1984). Marton and Saljo (1976) were led to distinguish between two different approaches to understanding. One is on a continuum called deep/surface. This approach is related to the students search for meaning. The other is on a continuum holistic/atomistic. It is related to the way students organize the information which they have. In the case of their research this related to an article which students had to read. For some "learning is through the discourse and for others learning is the learning of discourse". Those who adopt the former strategy get involved in the activity while those who take the latter view allow learning to 'happen' to them. It is this group who are surface learners who pay but superficial attention to the text,

who are passive, who do not reflect and who do not appreciate that understanding involves effort (to paraphrase Marton).
However one outcome of this work has been to focus on the influence of examinations and tests on student learning. Examinations may create circumstances in which students necessarily "surface learn" because of the quantity of information which has to be covered (Heywood, 1989). The perception that a student has of learning may also condition his/her approach (Wilson, 1981), and this has led one of us (A.F.) to argue that it is a technique adopted to suit the circumstance and not a preferred learning style. i.e. It is in itself a surface adaptation and not a deep disposition.
Be that as it may it is yet another indicator of the influence which teachers can have on learning. It is not surprising therefore to find in the literature, suggestions to the effect that teachers should match their teaching styles to those of their students (Grasha, 1984).
Given that this seemed to be an issue of some importance it was felt that this dimension of learning should be incorporated in our course in the applied psychology instruction which is within the diploma programme for educating students for teaching in second-level education. As part of the practical work with these student-teachers we set out to answer the questions "Are learning styles important?", and, "Should teaching styles be matched to learning styles?". We report on the outcomes of our work.

Toward Practical Work on Learning Styles:

Since 1985 we have developed a student teacher as researcher programme within the course in the applied psychology of instruction. The evolution of this course has been described elsewhere (Heywood,1991). Suffice it to say that for the coursework assessment the students are required to undertake a number of classroom activities in which they evaluate a variety of instructional theories within the classes which they control during their teaching practice. Two examples of the reports which have to be submitted are given in the appendix together with a brief description of the requirements for planning, implementation and evaluation. An outline schema of the requirement for each activity (of which there are 6) is given in Exhibit I of the appendix.
In this discussion we are only concerned with the work in this course on learning styles and its evolution.

Learning about Learning Styles during Student Teaching:

When we began these studies in 1986 our goal was to get the student-teachers to reflect on their own teaching style in relation to how students learn. Although our goal has remained the same the methods by which it is achieved have changed.
This was due to the fact that while we asked the students to read up literature on teaching and learning styles we did not give any detailed directions as to how they should experiment in the classroom.
We made no attempt to assess their teaching style or to guide them in this assessment. Thus a whole variety of approaches developed such as this one for a class in French (12-13 years olds).

> "I considered trying to create a relaxed, anxiety-free atmosphere, surmising that it would be conducive to learning; as it is a life situation for these young pupils, I considered it a suitable environment. Instead of binding the pupils in a rigid structure, controlling the quality of their thinking and selecting the topic for the lesson I decided to give them the freedom to work with each other".

She called this a teaching style. It related to the organization of the class. There is no mention of herself and her own disposition. At the same time she did learn about teaching mixed ability groups.

> "One conclusion I made was that this teaching style was difficult for a mixed ability group, as when it came to 'testing' at the end of the class, the low level group (she had organized the class in groups for role playing) found their own role-plays were not as good as they had thought. However, the

more important point to note was that the pupils were inter-acting and learning from their peers, those from whom I think, they learn best. Next time, perhaps, I would not have a performance of each scene: instead I may see each scene myself as I go round to each group and perhaps concentrate more on seeing the less able and more shy groups myself without forcing them to perform for the whole class"

In this early study there was considerable variety in the use made of the literature by the student-teachers of French. At one end of the spectrum we get support for the action taken from the literature thus:

"Again my approach was to give the lesson a definite structure. I would refer here to the article, Classroom Research on Matching Learning to Teaching Styles by Walter Doyle and Barry Rutherford. The point is made that 'existing research does suggest that there is an important practical interaction between the academic ability of students and the degree of structure provided by instruction. Cronbach and Snow (1977) concluded that high ability students appear to learn well under both structured and unstructured conditions, lower ability students, on the other hand, perform better in structured rather than unstructured situations. The lower ability students appear to need explicit guidance to navigate the demands of learning subject-matter in academic skills. The students which I teach, although not 'lower ability' over the entire range of subjects, are, in general, weak at French and hence need a great deal of guidance to facilitate their learning".

Whatever the level of understanding of the research, and in some reports no reference was made to the literature, the activities seemed to have been informed by the view that a teaching style is "a pervasive way of approaching the learners, that might be consistent with several ways of teaching". The definition of learning style except in the odd case did not go beyond something like that "which describes how a student learns and not what he has learned".
The group would probably have agreed with the view of one of them which was expressed thus

"By matching my teaching style with the pupils learning style in this lesson I hope to

- enhance content achievement.
- improve learner satisfaction.
- motivate students to continue to study French.
- vary the content and approach so that pupils will not have too much of the same thing.
- provide the pupils with new levels of simulation that are just beyond where they currently find themselves.
- to "stretch them to learn, since learning does involve stress, tension and anxiety to prove a challenge."

The problem with these exercises is that while they seemed to ensure variety in teaching the students were making comments on the basis of their opinions. That is opinion about how pupils learn and opinion about the best way to promote learning.
During the period between 1986 and 1989 this approach to coursework assessment has developed into five mini-research projects involving 6 lessons. Thus when this particular activity was further developed in 1988 the requirements on the students were very much greater.
Now the students were either required to read literature and formulate a hypothesis for testing or, were given a hypothesis for testing.
Having established the hypothesis they were required to devise and implement a lesson to test the hypothesis, and to give two evaluations the first immediately after the lesson, and the second as a result of a test at some time distant from the class (e.g. a week).
The test was to be designed to evaluate their chosen hypothesis in relation to the content of the lesson.

We had introduced the idea of learning styles in our induction course and also in the voluntary pre-experience course which we began in 1987 and, in the latter, administered the Kolb Learning Styles Inventory to the students. Since 1989 we have asked all students to complete the inventory and return the information to us. Not everyone has chosen to do this although the majority have. In both years they were shown a simplified inventory due to Robert Samples which had been further modified for use in Ireland by J.Kerley a research student in this School of Education. Our student-teachers were asked to test Kolb's theory with one or other of these inventories, preferably with the Kolb 1985 edition, and also, in the light of the paper by Grasha (1984) and their own data, to discuss the issue previously posed that teaching styles should be matched to learning styles.

This exercise was repeated in 1990-1991 and we have been able to inspect 69 reports one of which is reproduced in this Appendix. In both years the students responded to a short questionnaire. The 1991 activity differed in three respects from the 1990. First the students were not required to rehearse the theory except in so far as to demonstrate that they understood what learning style is and that they had a knowledge of the Kolb theory. Second, they were specifically instructed to design lessons which would take the pupils through the four phases of his cycle. They were shown McCarthy's (1984) examples.

Third, we obtained the learning styles, as assessed by the Kolb inventory, of most of the students.

The initial introduction to Kolb's theory is however done during the induction period prior to the commencement of the university teacher education programme.

As indicated, all the student-teachers are asked to complete the inventory along with the Myers-Briggs Type Inventory. Then, in the case of the Kolb inventory, they are asked to place themselves in one of the four quadrants with only the titles of the polar dimensions given. They are next placed together in their respective quadrant groups and invited to establish their strengths and weaknesses as learners, and possibly as teachers, and finally to offer a definition of their learning style. We observe that the methods which the quadrant groups use to tackle this problem reflect the major skills ascribed to that group by Kolb. For example the convergers proceed in a systematic logical fashion, the divergers find out all the differences, the assimilators wonder what in the theoretical underpinning of the exercise while the accommodators deal with the reality of the situation. This suggests that the inventory has face validity, that is to say that students use similar terms to Kolb's for the respective quadrants. When this exercise has been completed Kolb's theory is presented, and a discussion is held on the merits of the learning cycle for teaching. This method of presentation therefore follows Kolb's cycle. The concept stressed is that these learning skills are available within us but that we come to be disposed toward one in preference to the others. Most students normally find this a positive exercise in which other potentials which they may have are illuminated.

We shall concentrate on the 1990-1991 study, and will contend that inspection of the 1989-1990 reports would not lead to widely different conclusions.

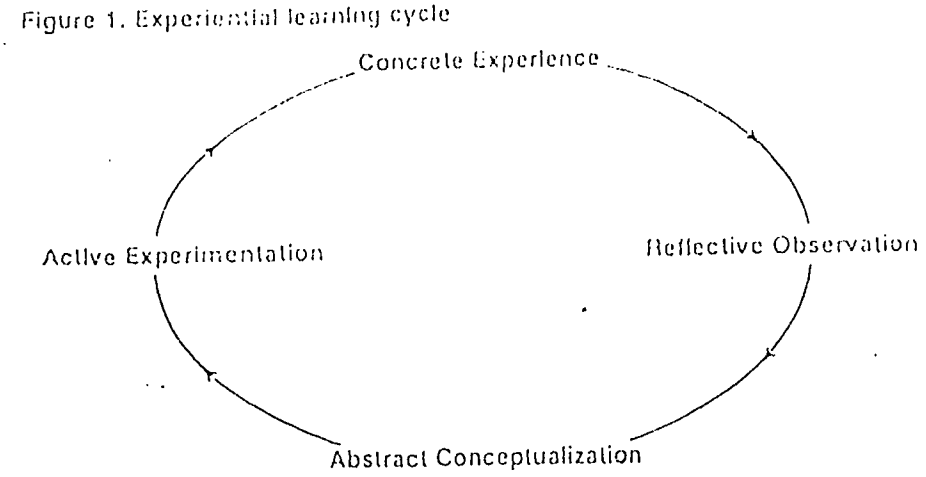
The students were given articles by Grasha (1984), and Svinicki and Dixon (1987) at the beginning of the lesson planning exercise in the second term.

The Learning Styles Theory of Kolb:

Kolb's model of learning stems from a widely accepted view of learning which is that it is a 'process whereby knowledge is created through the transformation of experience' (Kolb 1984, and also Saupe 1961, Heywood 1982). It follows from this that the way individuals grasp and transform knowledge is their learning style. It is a matter of simple common observation that individuals do not apprehend and transform knowledge in the same way. Kolb holds that there are four primary dispositions which form two dimensions (continua). The X axis of the model is a continuum which is polarised by those who think primarily in the concrete and those who think primarily in the abstract. The Y axis is a continuum polarised by those who think in active mode and those whose disposition is toward reflective (passive) thinking. This is diagrammatically represented in Figure 1. It follows from the definition of learning that we begin with our concrete experience. Thus a teacher is to design a lesson to follow the Kolb cycle that lesson will have to begin with the provision of a concrete experience in which the students can become involved. Provision has then to

be made for the students to reflect on the meaning of this experience and from this meaning to draw conclusions in the abstract. The actions and decisions which follow lead to new experiences, and learning begins again.

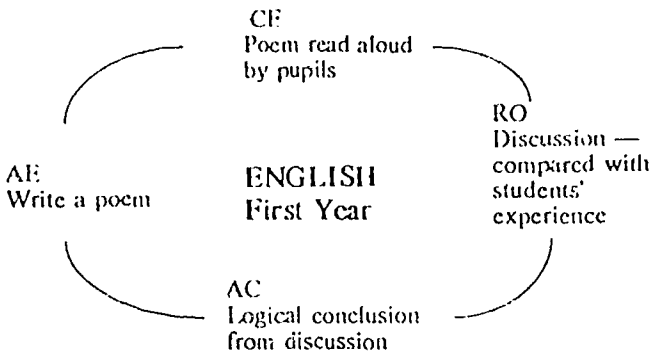
Figure 1: Experiential Learning Cycles



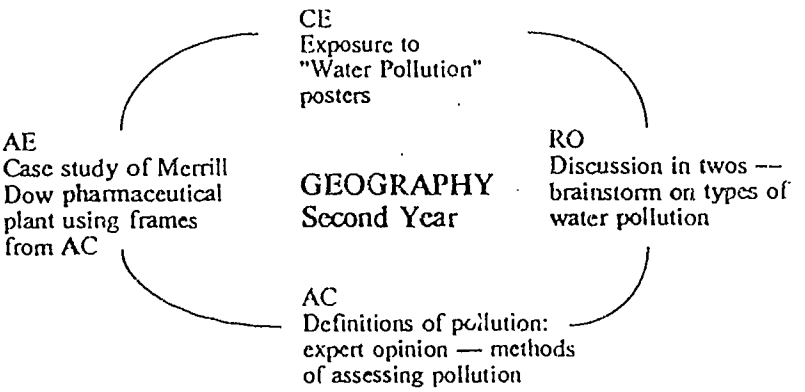
Svinicki and Dixon (1984) used this model as the basis for the selection and sequencing of instructional activities.
They show how different kinds of activities supported different phases of the learning cycle (e.g. concrete experience-laboratory work; reflective observation-discussion; abstract conceptualization model building, and active experimentation-simulations).
Svinicki and Dixon call the four activities Experiencing, Examining, Explaining and Applying. Many of our students have found these action verb descriptions helpful.
They went on to illustrate how the model could be applied to the different subjects of the curriculums. All of our students were provided with this paper and Figure 2 gives some examples of their interpretations of this model in their own subjects.
Kolb has suggested and Svinicki and Dixon agreed that the fundamental differences between the subject disciplines are reflected in their location in the quadrants which form Kolb's learning cycle. These quadrants represent four learning styles which Kolb considers to be fundamental.
Lying in the quadrant between concrete experience and reflective observation are the divergers. This term comes from the early research on creativity which distinguished between convergent and divergent thinking. We consider this earlier in the course under the heading of creativity, and it is only too apparent that our students-teachers find this and its opposite ,the converger, easy labels to apply (rightly or wrongly) to their students! (Heywood, 1982)The dominant learning styles of the converger are abstract conceptualization and active experimentation. They are located in the third quadrant. Among other things they prefer tests which require a single solution, and tend to prefer things to people. In contrast the divergers like to imagine and generate ideas. They do not perform well in tests which demand simple solutions. They are emotional and relate well to people.
Those whose dominant learning skills are abstract conceptualization and reflective observation are called assimilators by Kolb. Their primary concern is with concepts. They want to develop theories precisely and logically.

Figure 2

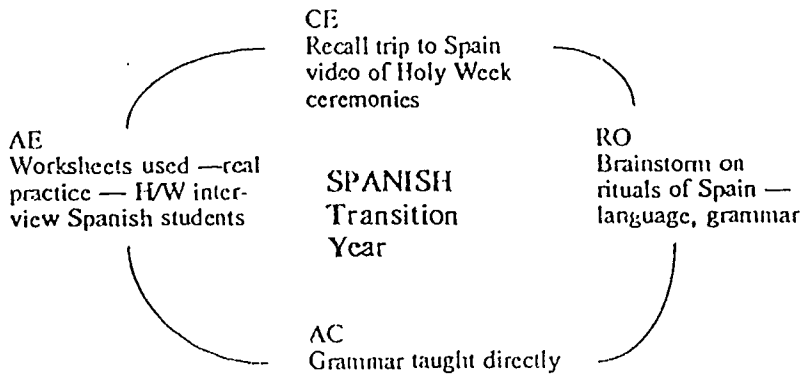
Poem appreciation



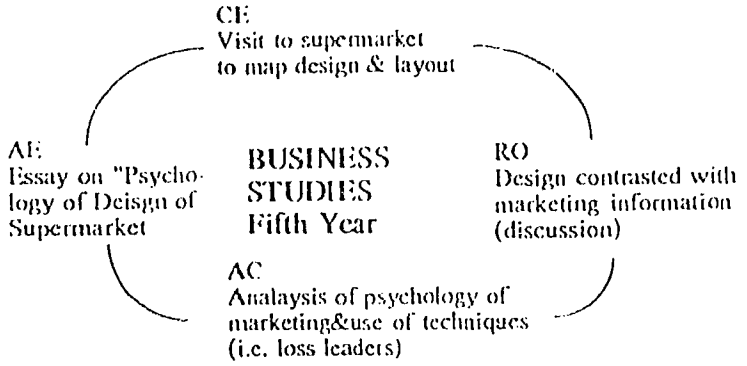
Water Pollution



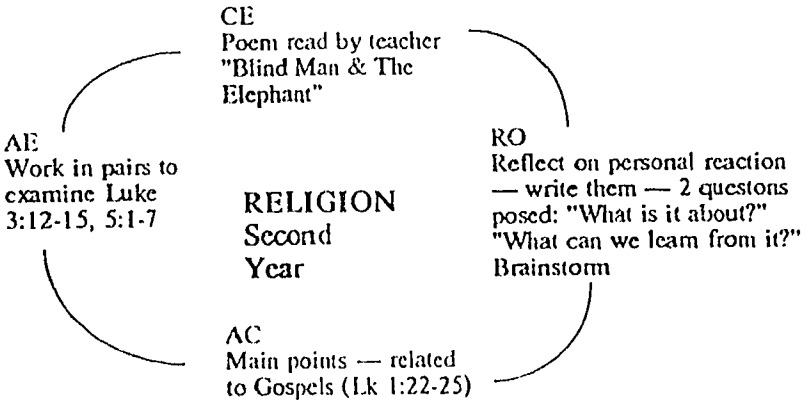
Rituals of Spain



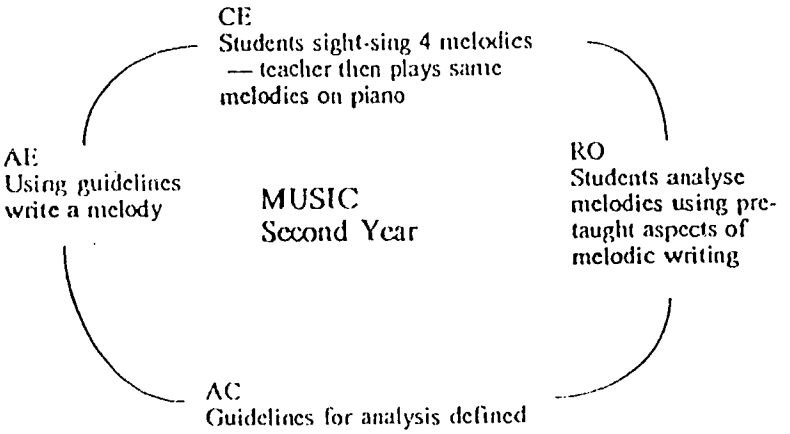
Advicertising and
Supermarket Design



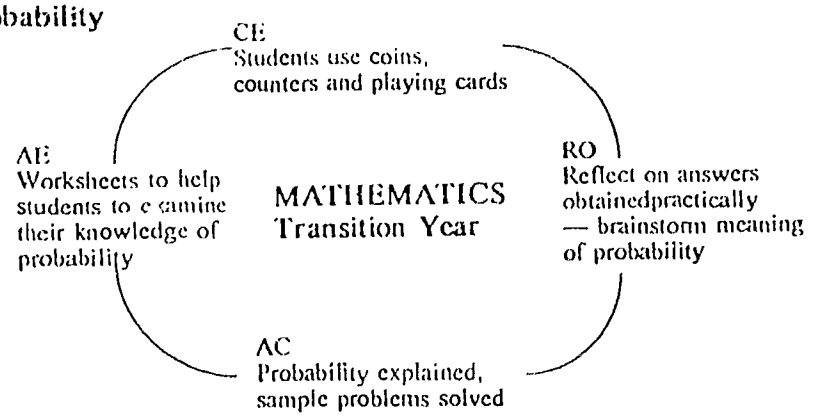
Gospel Themes



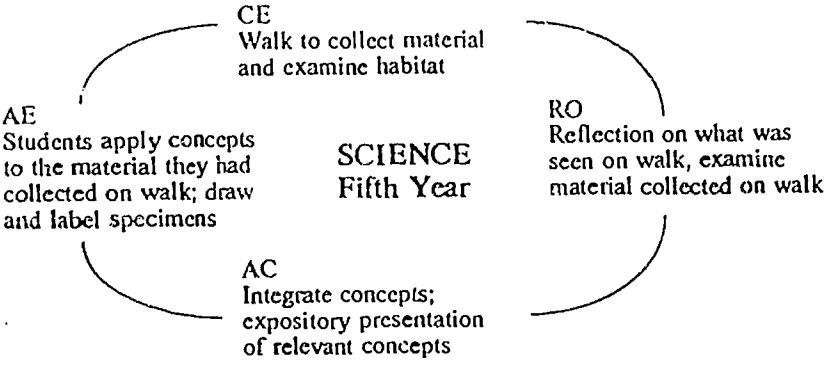
Melodic Writing



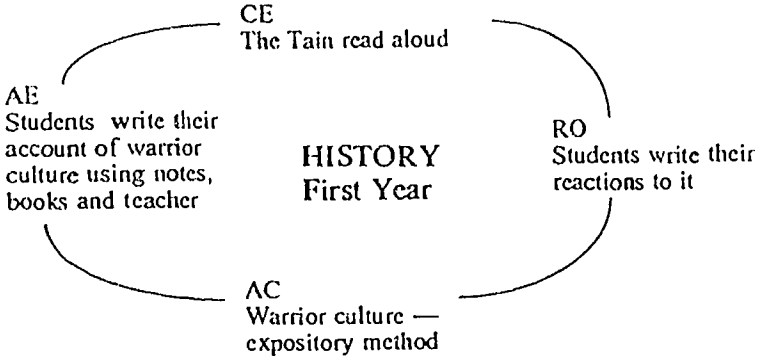
Probability



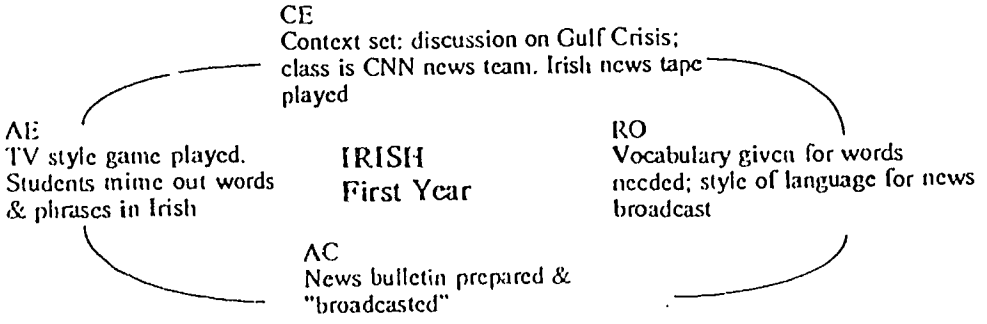
External Structure of Dicotyledonous Plant



Warrior Culture of the Celts



Vocabulary for use in a Current Event (Gulf Crisis)



They are specially interested in the alternatives available to the solution of problems. They belong to the second quadrant and are the bipolar opposite of the accommodators who reside in the fourth quadrant. The accommodators want to devise and implement experiments and will take more risks than those with the other learning styles. Kolb says ' We have labelled this style 'accommodator' because he or she tends to excel in those situations where he or she must adapt himself to specific immediate circumstances.
Kolb developed the Learning Styles Inventory to discriminate between these four styles. From studies of undergraduates (Kolb, 1976) he identified students of English and History as being predominantly divergers; Mathematics and Chemistry as being assimilators; engineers as convergers, and business students as assimilators. The Learning Styles Inventory was evaluated for validity and reliability and as a result Kolb modified it in 1985 (Kolb, 1985).
Recent studies suggest that the internal consistency (reliability) of the inventory have improved (Veres, Sims and Shake, 1987). A more recent investigation of the reliability and construct validity by Ruble and Stout (1990) confirmed that there was some improvement in reliability but the design of scoring columns could inflate estimates of both reliability and construct validity. Their factorial analyses also suggested that the learning abilities could be relatively separate constructs rather than bi-polar opposites.
Our concern with the Learning Styles Inventory has not been so much with its reliability and validity in training but as we indicated above with its value as an 'operator' in education, that is to say as a mechanism of getting student-teachers to reflect on themselves and on their pupils during the process of developing skill in self-assessment.

The Effects of the Exercise on the Student Teachers:

Of those who claimed that the exercise had caused them to change their role as a teacher, eighty-two percent (22) also claimed that the class noticed a difference in their teaching approach.
This may be contrasted with the forty-three percent (12) of those who claimed no change in their role but that nevertheless the class noticed a difference in their teaching approach. (See also Table 1) This serves to support the view that planning lessons in the phases of the Kolb cycle results in noticeable changes in teacher behaviour on the part of the consumers.
It is interesting to note however that there is an inverse relationship between age as measured by class (grade) year and teacher belief about pupil perception of changes in their approach to teaching. Whereas the majority of older students (14+ years) were not reported as having observed changes, the majority of the younger children did. However there appears to be an element in this perception which is a function of the perceived achievement level of the class. Those classes which were said to be high achievers were more often considered by the student-teachers to be aware of differences in their teaching approach.
Because a large number of the student-teachers told their pupils that they were participating in a research experiment the data above has been examined for a possible halo effect. The evidence suggests that the effect if any of telling students about the experiment was negative.
Forty four percent (25) of all the student-teachers claimed that the exercise required from them a change in attitude toward their teaching. Of these, nine (36%) considered it to be a risky exercise with their class compared with two who were not constrained to make an attitude change, the total number of whom was 31.

Of those who considered it risky none would not take other risks in the future which suggests they gained confidence in taking risks as a result of the exercise. Another point to note is that the majority of student-teachers reported that their pupils found the class enjoyable. Fourteen (24%) reported improved discipline and only two reported that their class was more naughty than usual.
No change in disciplinary behaviour was reported by twenty-two (39%). Student-teacher apprehension as reported in the section above did not appear to influence class behaviour. It may be a matter of concern, and is certainly a matter for further investigation, that it is possible that apprehension may have influenced the student-teachers disciplinary behaviour

because half of those who reported normal behaviour were apprehensive (leading possibly to heavyhandedness with their class). But the numbers were so small that we could not analyze further and in particular attempt to obtain a relationship with scepticism.

Table 1.

	YES		NO		NO ANSWER	
	1991	1990	1991	1990	1990	1990
1. Did the pupils notice a difference in your teaching approach ?	34 (60)	37 (58)	22 (37)	22 (34)	1	5
*2. Did the exercise demand from you a considerable change in attitude toward your teaching?	25 (44)	34 (53)	31 (51)	30 (47)	1	
3. Did you consider it risky to try this exercise with your class?	12 (21)	21 (32)	43 (76)	43 (66)	3	1
4. Would you be willing to take other risks in the future?	51 (90)	60 (92)	2 (4)	1 (2)	4	4 (6)
5. Did the Learning Style Exercise make you change your role as a teacher?	27 (47)	31 (48)	28 (49)	31 (48)	2	3

* Item 2 should be interpreted as "change in attitude as some student-teachers crossed out considerable.
Figures in brackets are approximate percentages.

Student-Teaching and Learning Style.

In the questionnaire three open ended questions were asked which related to the perception which the student teachers had of their learning styles and its implication for teaching.
Following the forced-response item -" Did the learning style exercise make you change your role as a teacher?" (Yes...No...) we asked " In what way?"
Twenty six of the fifty seven teachers (i.e. 45%) who also replied "Yes" also made comments (35 in all). When these are related to their learning styles previously obtained when they responded to the Kolb inventory during the induction course, we find that the divergers reported least change. This suggest, that these students, in keeping with their style, tend in general to vary their teaching, and this view is supported by the comments which they made in the evaluation sections of their reports. Thus in Table 2 where the learning styles of the class are compared the percentage in each group reporting that they had changed their role as a teacher.
The convergers claim to have changed their role more than any other group, and this, like the respondents in our earliest work, was in the direction of greater pupil-interaction with pupil and variety in their classes. Table 3 summarises these comments. The pattern of these responses suggests that the two styles which theory suggest are most inclined to expository teaching (assimilator and converger) may benefit most from exploring instructional strategies favoured by the accommodator and diverger styles.
In response to the invitation to make general comments 29 of the 57 students (51%) responded. Table 4 separates out the four learning styles among the respondents and as before relates them to the learning styles obtained during the education course. It will be seen that the assimilators were less forthcoming than those with other styles, and that the divergers made the most negative comments which shows, perhaps, a dislike for the constraint imposed on them by the formal procedures of the activity.
Table 5 contains a more detailed summary of the comments. The numbers are so small that no further analysis is possible except to draw attention to the convergers interest in "good results" which is in keeping with the focus of their style.

Table 2.: Reporting change in role as teacher

	Diverger	Assimilator	Converger	Accommodator
	%	%	%	%
Respondents*	10	48	33	10
All Students	23	43	22	12

*Note: Learning Styles were obtained during the induction period, students whose style is unknown are excluded, N=73.

Table 3. Learning Style of Students -comments made*

Comment	Diverger	Assimilator	Converger	Accommodator	Unknown	N
Awareness of need to cater for different styles.	1	5	3	1	2	12
More interaction student centred study.			3	4	1	8
Less formal teaching, more facilitation.	1	5	3	1	2	12
Psychological approach.				1		1
Unspecified.		1			1	2

*Note: some students made more than one comment.

Table 4. Responses: Learning Style and Respondents.

	Diverger		Assimilator		Converger		Accommodator		N *
Responses	21%		25%		38%		17%		24
All Students	23%		43%		22%		12%		73
Responses									
Positive **	4	16%	8	32%	10	40%	3	12%	25
Negative ***	5	45%	2	18%	2	18%	2	18%	11

* Students ignored for whom LSI results were not available.
** % Of positive responses.
*** % Of negative responses.

Table 5. Final Comments and Learning Style of Respondents.

Comments.	Diverger	Assimilator	Converger	Accommodator	X	N*
Positive						27
helped as a teacher.	2	5	3	1	2	13
Good Results.			4			4
Students appreciate each other.			1	1		2
Students interested, enjoyed.	1	1	2			4
Other.	1	2		1		4
Negative						14
Need more help to do.		1			1	2
Unsuitable for First years.	1	1	1	1		4
Time consuming.	3					3
Inventory-too limited a view of a person.			1	1	2	4
Other.	1					1
Neutral.					1	1
N=	9	10	12	5	6	

* (Some students made more than one comment.)

We have also been interested to see if the adoption by Samples of the inventory for younger people works. In the sections which follows we describe the response of our students-teachers to their use of one of the Learning Styles Inventories with their students.

The Pupils in the Study: Class Grade and Achievement Level:

As will be seen from Table 6 the student-teachers are mainly required to take classes in the junior cycle of second level education excepting the classes which take public examinations (third year and 6th year).

Table 6.

Year taught	Total No. of Classes 1991	1990	Total No. of Pupils
1	19	(23)	485
2	11	(16)	259
3 (Exam)	1	(7)	33
4 (transition)	8	(1)	123
5	5	(14) *	101
Data not provided	7		
Total	51		1001

* also 3 6th (Examination year) and 1 adult class.

Table 7.

Subjects Taught	No. of Reports analyzed. 1991	1990
Science	4	(11)
History	4	(4)
Geography	8	(3)
Spanish	1	(1)
Music	4	(7)
Maths	4	(2)
RE	1	(23)
Business Studies	2	(4)
French	3	(4)
German	6	(3)
English	8	(14)
Total	45*	

The subject samples are small, (Table 7) but the reports can be compared with those for the previous year, the numbers which are given in brackets. The same reservation applies to the year level of class. However with this investigation built into our teaching as a programme of action research it will be possible to increase the data base.

The ability levels described in Table 8 are those provided by the student-teachers. In 1991 only one student-teacher reported a low ability group. Six reported a high ability group while the majority reported mixed ability classes.

Table 8.

Received Achievement levels		Number of Classes 1991	1990
High Achievers		6	(10)
Low Achievers		1	(8)
Mixed Ability	(Balance in Favour of High Achievers)	21	(17)
Mixed Ability	(Equally balanced)	10	(21)
Mixed Ability	(Balance in Favour of Low Achievers)	11	(3)
Data not provided.		8	
	subtotal	57	59
Average Ability		not included	(6)
	Total	57	(65)

Student Teacher Attitudes to the Learning Styles Inventory:

A number of student-teachers reported that the younger students had difficulty in understanding the words of the inventory, and one reported that a group of fifteen to sixteen year olds had also had such difficulty. Some took a lot of time to answer the questionnaire. Many student-teachers however made no comment.

One student reported that she had administered the questionnaire to her first year (12-13 year olds) class one month before doing the lesson.

She found that some of the words used were so "incomprehensible" that the pupils had to rely on her interpretations.

> "I also feel that in answering the questions, people (children and adults) tend to choose the answer which corresponds to how they would like to see themselves as opposed to how they really are. I am still not sure to what extent I personally was guilty of this tendency in my own answers in September 1990"

Because of these doubts she not only questioned the validity of the questionnaire but decided to administer it again. Of the 21 students who answered the questionnaire on both occasions 7 (i.e. one third) changed learning styles between the first and second tests. Inspection of the results suggests that there was a general movement toward the centre of the axes.

Fortunately, the requirements of the course dictated that she should continue with the experiments. When she came to evaluate her work she concluded that although there was no evidence to support the view that students learn best in the phase which corresponds to their own learning style, teaching a lesson which passes through the Kolb cycle improves learning, and many other students also thought this to be the case. She also raised a number of other issues one of which will be discussed below.

Twenty four percent (14) of our sample of student-teachers (N=57) said that they were sceptical about the learning styles exercise before they began the class. Of these seventy-nine percent (11) said that their class was successful. Only one said it was unsuccessful. But of greater interest is the fact that over half (64%) of those who were sceptical said that they would examine the learning styles of their pupils again.

Nearly as many of this group thought their pupils required training in learning styles. But less than half of this group (37%) would teach the children their learning styles.

In marked contrast seventy-seven percent (24) of those who claimed to be open-minded concerning the inventory and fifty-eight percent (7) who said they were not sceptical of learning styles said that they would teach children their learning styles. This suggests that

while the sceptics see some advantages for the teacher in the exercise they see no benefit for their children which is indicative of an underlying level of scepticism. Taking the group as a whole (see table 9) the majority (73%) of those who claimed they would examine learning styles of their children would also teach them about learning styles. It is worth recording that the sceptics reported themselves as being more apprehensive about the conduct of the lesson than either the open-minded or not sceptical groups (as defined in the questionnaire). It seems that the 1990 group were probably more enthusiastic and less sceptical about the exercise than this 1991 group.

Table 9.

Scepticism about learning styles exercise	Not sceptical		sceptical		open-minded		no answer	
	1991	1990	1991	1990	1991	1990	1991	1990
	12 (20)	21 (32)	14 (24)	12 (18)	31 (53)	32 (49)	2	(0)

	yes		no		no reply	
	1991	1990	1991	1990	1991	1990
would you examine the learning style of your students again?	48 (84)	60 (92)	7 (12)	3 (5)	2	2
would you, in future, teach children their Learning Styles?	36 (63)	55 (85)	17 (30)	7 (11)	4	1
Do you think pupils need training in Learning Styles?	44 (77)	57 (88)	10 (18)	5 (8)	3	3

Figures in brackets are approximate percentages.
N=57

The Inventory and the Younger Pupil.

The student who tested her students twice made this comment about the distribution of the learning styles in her class.

" the predominance of accommodators in the class has led me to the reflection that it is age-related. Many of these students (12-13 years) may just be coming out of the period of concrete operations and it is normal that they would have as first preference the"action" oriented option".
"Is", asks this student, "a measure of L.S. valid before their personalities have developed more fully? Will these accommodators change style as they develop?"

Related to this is the press of the learning environment to which the students become accustomed. The student-teachers report, and it is our experience, that teaching is second-level education in Ireland tends to be expository because of beliefs about the requirements of the public examinations the first of which is taken at the end of the third year. Teachers believe that there is only one way to cover the syllabus and children adapt their learning to the recall of information suitable for the examination. The teachers 'accommodate' to this need for surface learning for the examination, and this they may reflect in their learning style responses. We believe that the limited types of instruction used in schools led the pupils to enjoy the classes which were devised to meet the Kolb cycle because whether in a single lesson or over several lessons, as was sometimes the case, the student-teachers reported, with only three exceptions, that their pupils enjoyed the learning cycle lessons.

The Course and the Tutor:

As has been noticed elsewhere (Heywood,1991) the development of this "student-teacher as researcher" programme has caused profound changes in the course.

It has become highly focused on the five activities, and much of what was dealt with in the lecture programme in the areas of motivation has been pushed back into the induction programme and other courses. It should be noticed that a course in adolescent psychology is always run in parallel with the applied psychology of instruction and there were overlaps between these two courses.

The response to student requests for more information about requirements for the activities and their demand for feedback has led to the development of the criterion referenced scheme (see appendix), precise instructions for a limited survey of the literature and immediate assessment.

Many of the lectures are now discussion sessions on the problems posed by the implementation of each activity. Five sessions are devoted to feedback reports from the assessor-tutor. The students see the marks and are allowed to negotiate.

Students spend a considerable amount of time in planning and report writing, and some simplifications have been and are being introduced. The time spent by the tutor in assessment for this exercise amounted to between 15-20 minutes per report, and was equivalent to approximately twenty-two hours work or, nearly a full-time week.

Discussion:

The purposes of this report have been to show how we attempt to relate theory and practice during the student-teacher's classroom practice. We ask our students to come to their own conclusions about the value of understanding learning styles as a result of their investigations.

In this way we hope to inculcate a researcher's attitude to classroom practice so that when they come to practice as professionals they will systematically subject some of the problems they experience to systematic evaluation.

As one of five activities devoted to these objectives we asked a group of teachers to focus on the "matching teaching to learning styles controversy", and to come to a conclusion about whether teaching and learning styles should be matched. They were to arrive at their conclusions by an exercise in which they had to design a lesson or lessons in which each of four phases had to be designed to meet each of the four phases of the Kolb Learning Cycle. They were then to obtain the learning styles of their students using either the Kolb or a simplified inventory, and establish if those students designated as having learning style 'X' performed best in the quadrant of the lesson associated with X. The history of how we arrived at the design of this exercise is given.

In addition to the reports which the students submitted they also answered a questionnaire. Two (Three) of the reports have been included in the appendix. Other examples of how the model was used by one group of teachers in 1991 were given in the text.

Despite many reservations about the reliability and validity of the inventory, and in particular, the simplified inventory for younger children student-teachers felt the exercise was useful. They did not come to the view that learning styles should be matched to teaching style but rather that these should be variety in instruction. From the tutor's perspective the student-teachers were sensitized to the children's needs arising out of their individual differences and preferences, and therefore the need for a variety of teaching strategies.

This approach illustrates the use of the inventories as "operators" regardless of what they actually measure. Further we have found it to be a useful tool for framing discussion.

The limited evidence which we have suggests that the classroom methods adopted by the student-teachers may limited by their own needs and preferences. This limitation has been reinforced by their previous experience of education at school and university which emphasises content regurgitation at the expense of conceptualization, understanding and application. This view is supported by the extensive information given in their educational autobiographies, journals, and these reports.

Finally it is evident from the examples in the appendix that the student reports contain much information about teaching from the perspective of the student-teaching, and that an analysis of the examples given in the reports could serve as evaluations of instructional theories. We are in the process of examining the reports of other instructional activities with this in mind.

Occasionally in keeping with our goal to train students to be researchers in the classroom, and therefore, to detect their own problems for inquiry these reports contain hypotheses which could be tested.

For example the illustration quoted above to the effect that there may be proportionately more accommodators in the first year, because of the Piagetian stage which the pupils are at, is open to investigation.

That such an investigation would be worthwhile in the future is supported by a simple analysis of the student-teacher scored learning style inventories of their pupils. We find that for the year in question that there were in fact more accommodators as a proportion of the population in the first year class than in the other classes of second level education.

We found that 58% of first years were accommodators compared with 49%, 47% and 42% respectively for assimilators, convergers and divergers. This can be contrasted with 19%, 37%, 38% and 33% for those in classes higher than second-year.

It would seem that there is also a gender difference with younger boys and older girls being proportionately more in the accommodator needs.

Since these figures were arrived at without our checking the student scoring , it is necessary for us to repeat the activity under standardised conditions so that we can be absolutely sure of the data. That we should want to do this in no way invalidates the activity or, the attitudes of the students to the influence which it has on them as a technique for reinforcing in student-teachers the idea and value of variety in instruction .

Our experience confirms Diamond's (1991) view that, "teacher educators need to resist the temptation to aim at short-term goals such as mastery of the survival skills relating to discipline...[seeking] instead to help beginning teachers to become students of their own teaching". (p.19)

Appendix

As indicated the main text is based on face validity inspections of student teacher activities undertaken in the classroom together with responses made to a questionnaire about these activities by the students concerned.
Six such activities are carried out during the year and the students work is reviewed as soon as possible after submission with the aid of a criterion referenced schedule.
This schedule, a copy of which is shown in Exhibit I is intended as a guide to help the students obtain mastery.. The marks on the schedule are intended to indicate the relative importance attached to each activity. A column for the students self-assessment is provided. An impression score based on the criteria is given and the students can negotiate the final mark with the tutor. In general detailed comments with the emphasis on the positive aspects of the reports are given on the reverse side.
It will be seen that the assessment-schedule follows the pattern of the rubric the outline of which is shown in Exhibit II. Students are given detailed instructions and reading during the lecture programme. Some readings are provided.
One example of these student reports follow. It omits the samples of pupil work which have to be submitted. It should be noted that these classroom activities are required in addition to that required by their subject-specific methodology tutors. Moreover the problems to be solved might cause the activities to follow an atypical pattern which is the case with those presented here.
In this case it does not demonstrate the fact that methodology in the teaching of the French language is firmly grounded in the communicative approach.
This section of our Department and in particular Mr.S.Devitt is well known for its development of the language training newspaper Authentik.
The student Miss Charlotte L. Callaghan has graciously allowed us to produce her work in the form that it was submitted. They know well that it is easy to pick holes in any endeavour of this kind more especially when it is produced under high pressure. We hope, nevertheless, that our readers will not only appreciate this to be the case but like us take a positively encouraging view of the work they did, and our attempt to relate theory to practice in the classroom.

J.Heywood.

EXHIBIT I
The Assessment Checklist.

The marks are intended to be a guide to the relative importance of the sections in the calculation of the final mark.

	ASSESSMENT CHECKLIST	YOUR OWN ASSESSMENT	TUTOR'S ASSESSMENT
1	Statement of class details including entering characteristics (a) brief statement (gender, number, age, ability range (1);(b) show where they are in the subject (3) (c) (a) and (b) plus detailed description of the pupils(5). If you have given these details in a previous lesson plan enter this information at the top of this lesson plan. Note. If there have been any changes in respect of particular individuals (to maximum of 5 for section)		
2	Adequate statement of theoretical background (a) as would be copied in a book (3); b) showing additional insight, e.g. relationships with other theories (5); (c) showing linkage with lesson . To avoid duplication this section plan see section 5 below (7) (to maximum of 7 for section)		
3	Statement of behavioural objectives (a) imprecise (b) precise, but wanting more or less than the lesson could or can give (2); (c) process objectives provided they can be observed in respect of individuals in the class (2); (d) terminal objectives stating what the student will be able to do at the end of the class in terms of knowledge and learning skills (5) (to max of 5 for section)		
4	A test designed to assess that the objectives have been achieved (6) and that the leaning theory under evaluation has been tested (5). (to maximum of 12 for section)		
5	Schema of lesson plans showing chases, strategies and summary of contact (1c). Clearly showing how the instructional strategies relate to the problem established in the theoretical background. See section 2 above. Also see exhibit 5.9 for outline of schema. Double sided A4 may be used (to maximum of 15 for section)		
6	Evaluation showing (a) what happened in the class; (b) personal response to class (5); (c) test at a time distant from the class (see note 4); (d) simple statistics of the tests — (i) mean scores (3); (ii) standard deviations (3); (e) interpretation (3) and conclusions from the tests (5); (f) reservations and assumptions (5); (g) supporting illustrations from students' work in class or the test (4);. NB If a test is not used a full justification of method of evaluation used must be given.		
7	Evaluation of the theory (3) in the light of this study and your other experience during the year		
8	Presentation (a) formal according to regulations (i.e. A4 paper on one side, margins etc) (3); (b) general literacy (e.g. grammar, explanations to the point (7). To Maximum of 7 for section).		

THIS ASSESSMENT SHOULD NOT BE TAKEN TO MEAN THAT THE CONTENT IS NECESSARILY CORRECT.

EXHIBIT II

1. ACADEMIC COURSE: INTRODUCTION TO THE ACTIVITY (2-4 HOURS)
2. STUDENT PREPARATION
   - A. READS THE LITERATURE ON THE DESIGNATED TOPIC
   - B. SELECT A SMALL TOPIC FROM THE LITERATURE FOR INVESTIGATION (THIS MAY BE TO REPLICATE ONE OF THE STUDIES REPORTED IN THE LITERATURE)
   - C. DESIGN A LESSON TO TEST THE HYPOTHESIS SHOWN IN B. (THIS TO INCLUDE THE ENTERING CHARACTERISTICS OF THE PUPILS, A STATEMENT OF AIMS AND OBJECTIVES, THE INSTRUCTIONAL PROCEDURES SHOWING HOW THEY WILL TEST THE HYPOTHESIS, ETC.)
   - D. DESIGN A PUPIL TEST OF KNOWLEDGE AND SKILL WHICH IS DIRECTLY RELATED TO THE OBJECTIVES OF THE LESSON.
3. ACADEMIC COURSE (ONLY IF STUDENTS REQUIRE SEMINAR) TO IRON OUT DIFFICULTIES (2 HOURS)
4. STUDENT IMPLEMENTATION
   - A. IMPLEMENT CLASS AS DESIGNED
   - B. IMMEDIATE EVALUATION
     - I) WHAT HAPPENED IN THE CLASS?
     - II) WHAT HAPPENED TO ME?
     - III) WHAT HAVE I LEARNED ABOUT MYSELF?
     - IV) WHAT HAVE I LEARNED ABOUT MY PUPILS?
5. ONE WEEK (OR SO) LATER
   - A. TEST STUDENTS
   - B. SUBSTANTIVE EVALUATION
     - I) HOW DOES WHAT I HAVE DONE RELATE TO THE THEORY WHICH I SET OUT TO EVALUATE?
     - II) HOW, IF AT ALL, WILL THIS INFLUENCE MY TEACHING IN THE FUTURE?
   - C. SUBMIT REPORT AT THE REQUIRED TIME.
6. ACADEMIC ACTIVITY
   REPORTS ASSESSED USING A CRITERION REFERENCE SCHEME
7. ACADEMIC COURSE (TWO TO THREE WEEKS LATER)
   - A. RETURN ASSESSED REPORTS
   - B EXERCISE IN SELF-ASSESSMENT
     WITH SOME LESSON PLANS RETURN REPORTS WITHOUT ASSESSMENT. ASK THEM AND ONE OTHER STUDENT TO MARK THEIR REPORTS AND COMPARE WITH TUTOR'S ASSESSMENT.
   - C. ASK STUDENTS TO COMPLETE AN EVALUATION SCHEDULE
   - D. OVERALL EVALUATION IN SEMINAR BY THE TUTOR (1-2 HOURS)

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Learning and Teaching Styles in the Classroom
by
Charlotte L. Callaghan

Lesson Scheme and Stages. (See Exhibit I and II of the Appendix).

A. Entering characteristics:

This is a second year class who are preparing for their Junior Certificate Examination in 1992. Salut 2 textbook and workbook are the course programme the pupils are following this year. To date this class have covered a vast array of topics, for example writing a letter to a pen-pal, exchanging information about oneself, one's family and interests, writing a formal letter, e.g. to a Tourist Office, a Youth Hostel, buying a ticket, finding out about departures and arrivals of trains, finding your way in the station, reading signs and notices in a station, asking and saying what you did or didn't do yesterday, last week etc., saying what something was like, saying there was/were, telling and understanding what used to happen regularly in the past, describing people, places and things as they were in the past. Presently, the pupil is studying a unit which will help her to buy a snack at a fast-food counter or in a French cafe.

I have this class since a week for French. They are a lively and boisterous group of girls at the best of times. Several pupils in the class caused major problems at the beginning of the year but thankfully these girls appeared to have settled down to work. However, from time to time this class has their moments and can get carried away doing an exercise. Every time I do role play or simulations with these pupils, they really are excellent at these type of activities and seem to get better and better at them.

On the other hand, this class is particularly weak at oral work — the weaker pupils cannot get the gist of the passage at all even though it may be played three/four times at intervals. Overall though this class is of a mixed ability with the balance in favour of high achievers. The weaker pupils of the class are poor at the subject as a result of little or no input into class work, low self-esteem or sheer laziness. No one in the class is of a remedial standard, each pupil has the ability to do very well if she applies herself and gives of her best. I feel my role is to encourage the weaker pupils to like the language and help them to grow to like the language too. In general, the majority of girls have an integrative motivation with regard to French. There are only about five or six girls who have no interest in French at all and do it only because they have to.

Personally, I find this class a real challenge to teach. They need a nice snappy pace to keep them on their toes otherwise they become bored, Through the learning style exercise, I hope to keep their interest and also make them aware of how they learn.

Class:	2nd Year.
Ability Range:	Mixed Ability (balance in favour of high achievers).
Age:	13+.
Gender:	Female.
Number:	31 Pupils.
Subject:	French.
Aids required:	Cassette, tape recorder, realia and pictures of fruit.
Type of lesson:	Practice lesson.

The David Kolb Learning Style Inventory was administered to the pupils a week before this lesson.

B. Aims and Objectives of the Lesson:

Aim: To make the pupil aware of the fact that everyone learns in a different way.
To introduce the pupil to the idea that there are four different processes involved in learning styles as advocated by David Kolb in his Learning Style Inventory.
Finally to equip the pupil with a competence in French which would enable her to order and pay for an ice-cream of her choice.

Non- behavioural objective: To enable the pupil to cope with the buying and paying for an ice-cream of her choice.

Behavioural objectives:

By the end of the lesson, the pupil should be able to:

1. Identify the ice-cream flavour of her choice.
2. Evaluate her choice.
3. List flavours of ice-cream.
4. Discuss buying and paying for an ice-cream.
5. Write a dialogue about buying and paying for an ice-cream.

C. Lesson Phases.

Kolb stage 1: Experiencing

1. Introduction:

The pupils are shown pictures of different fruits. They are asked to state:

A. *Quelle sorte de glace aimez-vous?*
(What kind of ice-cream do you like?)

B. *Pourquoi aimez-vous ce parfum?*
(Why do you like this flavour?)

The lesson begins with the pupil's personal involvement in a specific experience, i.e. *Quelle sorte de glace aimez-vous?* Through the means of illustrations (something concrete) and questions relating to the personal experiences of the pupil. She notes which kind of ice-cream she likes and the reasons why. — e.g. of possible pupil feedback:

** Quelle sorte de glace aimez-vous?*
- J'aime une glace a la vanille/au cafe/a la fraise
(I like vanilla,coffee,strawberry ice-cream)
** Pourquoi aimez-vous ce parfum?*
- J'aime ce parfum parce que c'est delicieux/super/extra!

Pupil identifies ice-cream of her choice. If the pupil does not know French terminology for that particular flavour, teacher will help her. Therefore, the first part of the lesson is creating an experience in which the pupil works individually. For the second part of the introduction stage, the pupil evaluates her choice of flavour by reflecting and analysing the experience. This stage of the lesson is especially relevant to accommodators and divergers who enjoy experiencing learning in relation to situations/experiences.

Kolb stage 2: Examining

2. Presentation (i):

To stimulate thought a brainstorming session on different ice-cream flavours will occur. As far as possible, the list of flavours will be elicited from the pupil. All answers supplied by the pupil will be written on the board. The brainstorming session should stimulate thought and keep the pupil's interest and motivation. Innovative learners (divergers) and analytic learners (assimilators) love this sort of activity. These learners acquire knowledge by thinking through ideas).

Nommez les parfums des glaces!
(Name the ice-cream flavour!)

Blackboard work:

Cafe	*Poire*	*Orange*
Noisette	*Ananas*	*Fraise*
Chocolat	*Fruits de la passion*	*Citron*
Caramel	*Cassis*	*Banane*
Pistache	*Prune*	*Framboise*
Vanille	*Abricot*	*Praline*

Above is list of flavours expected that the pupils will predict. Choral and individual repetition of the flavours shall take place to ensure the pupils know the meaning and phonetics of the above mentioned.

3. Presentation (ii):

Pictures of different flavours are put up on the blackboard. A label is available for each flavour. The pupil must label each flavour correctly. (pupils are called at random to this).

4. Presentation (iii):

The pupil listens to a dialogue about ordering and buying an ice-cream. The pupil's task is to answer a number of questions concerning the listening comprehension.

Questions a repondre: On handout as illustrated.

Kolb stage 3: Explaining

5. Application :

A model will be put forward to explain to the pupils how to construct a dialogue following the theme of buying and paying for an ice-cream.

Client -C. (Customer) *Serveur/Serveuse* - S. (Waiter/Waitress)

C.- *Une glace s'il vous plait.*
S.- *Simple ou double?*
C.- *Double, s'il vous plait.*
S.- *Quel parfum?*
C.- *Je voudrais une glace a la fraise s'il vous plait. (au cafe, a l'orange)*

Blackboard work:

	Masculine	Feminine	Vowel	Plural
une glace	*au cafe*	*a la fraise*	*a l'orange*	*aux fruits de la passion*
	au chocolat	*a la menthe*	*a l'ananas*	
	au citron	*a la framboise*		
	au cola	*a la banane*		
	au caramel	*a la vanille*		
	au cassis	*a la noisette*		
	au praline	*a la poire*		
		a la pistache		
		a la prune		
	a + le cafe	*a + la fraise*	*a + L'ananas*	*a + les fruits de la passion*
	au cafe	*a la fraise*	a l'ananas	*aux fruit de la passion*
	change	no change	no change	*change*

Explain to the pupil that one can also say: *Une vanille-fraise, une fraise, une chocolat, une pistache.*

End of dialogue:

S.- *Voila votre glace Monsieur.*
C.- *Ca fait combien?*
S.- *Ca fait huit francs s'il vous plait.*
C.- *Voila, au revoir Monsieur.*
S.- *Merci Monsieur.*

Learning styles that prefer things to be explained are the assimilators (analytic learners) and the convergers (common sense learners). Both of these learning styles perceive information abstractly. There is a difference though between the way these learning styles process this information- Assimilators process it reflectively whereas convergers process it actively. The former learning style loves things to be explained as in the traditional classroom, schools are designed for these learners. While the latter group have a limited tolerance for vague ideas, they need to know how things they are asked to do will help in real life.

Kolb stage 4: Applying

6. Conclusion:

If time permits, the pupil takes part in simulations of the dialogue which was listening to in the presentation stage of the lesson. This dialogue was also clarified and any problems were explained to the pupil in the application stage of the lesson.

Homework objective: The pupil writes a dialogue about buying and paying for an ice-cream of her choice.

D. Personal Response to the Lesson:

The lesson was carried out at a snappy pace. There was no time for the pupils to think of being disruptive- they had too much to do. I noticed immediately that the pupils were interested when they saw me laden down with pictures, tape recorder and realia. It seemed as if I automatically obtained their attention when I started to ask each of them what ice-cream they liked. The class progressed very smoothly with no discipline problems whatsoever — a miracle in itself for this class!

However, I do feel that the extra effort on my part for this exercise and taking the learning styles of each pupil into account when planning my lesson, really proved successful in achieving the above mentioned. Thus, from the outset of the class, I had the pupil's interest and full attention.

The pupils maintained their interest and motivation throughout the lesson. A relaxed atmosphere was present where pupils did not feel inhibited to ask or/and answer a question. My questioning technique was conducted in simple French and I was quite pleased with it. I must add here that the class, even though it is an elementary one, was carried out entirely through the use of the L2. Even the pupils made more of an effort to ask and/or answer questions in French. This helped a great many of them to feel more comfortable when speaking French. I believe this class worked well due to the variety and sheer pace of the lesson. The pupils did not have time to be bored, activities were constantly changing every five minutes. This challenged and stretched the pupil's ability and made them realise they know more French than what they previously thought. Without any doubt, this class enjoyed the lesson as the pupils stayed in an extra ten minutes in order to complete it. Only one or two pupils moaned at this but the rest of the class soon silenced them.

The class as a whole obviously did not mind missing ten minutes of their lunch hour. This in itself is proof enough that the class was a success from start to finish.

I felt most comfortable teaching the concrete experience and reflective observation stage of this lesson. This is a direct result of being a diverger as these processes are favoured by this learning style.

E. Evaluation Test- Two weeks later

Non-behavioural objective: To check the pupil's knowledge of buying and paying for an ice-cream of her choice.

Behavioural objectives: To see if the pupil is able to do the following:

1. Identify ice-cream flavour of her choice.
2. Evaluate her choice.
3. List flavours of ice-cream.
4. Discuss buying and paying for an ice-cream.
5. Write a dialogue about buying and paying for an ice-cream.

There are two tests: Test A is a written test and test B is an oral test based on a simulation.

Test A (15 minutes).

The pupil only has to answer two questions (minimum). She may do more than two questions if she wishes, but two questions of her choice must be answered in full. A mark is allocated out of ten for this test.

Kolb stage 1 : Experiencing

Questions:

* *Choissez une glace de votre choix.*
  (Choose an ice-cream of your choice)
* *Pourquoi avez-vous choisi cette glace ce parfum par rapport aux autres.* (Why have you chosen this ice-cream).

These two questions relate to concrete experience which includes the diverger (innovative learners) and accommodator (dynamic learners) learning styles. Divergers believe in their own experience and accommodators function by acting and testing experience.
In addition, divergers need to be involved personally in an activity in order to have their full attention. Accommodators too enjoy learning in situations which need flexibility.

STAGE 1 OF TEST A- CONCRETE EXPERIENCE

1. Creating an experience.
2. Reflecting and analysing experience.

Kolb stage 2: Examining

* *Donnez une carte de glace.*
  (Give an ice-cream menu).

This question focuses on the reflective observation process. Here, a brainstorming technique is employed to get the pupil thinking. The assimilators and divergers enjoy this kind of question as it makes them think about a certain thing, in this case ice-cream.

STAGE 2 OF TEST A- REFLECTIVE OBSERVATION

3. Integrating reflection analysis into concepts.
4. Developing concepts.

Kolb stage 3: Explaining

* *Expliquez les parfums que vous aimez.*
  (Explain/talk about the flavours you like).

One is looking for an explanation of the flavours the pupil likes. The question is particularly for those pupils who like abstract conceptualization, that is assimilators and convergers.
The pupil must describe the flavours she likes, e.g. *J'aime l'orange, le cafe, la vanille, le caramel, l'ananas, la pistache.* etc.

* *Donnez un dialogue ou une personne achete et paie pour une glace.*
  (give a dialogue in which a person buys and pays for an ice-cream).

This question also concentrates on the abstract conceptualization process.

* *Quelles sortes de glaces preferez-vous?*
  (What kind of ice-creams do you like?)

The above is the final question involving abstract conceptualization.

STAGE 3 OF TEST A- ABSTRACT CONCEPTUALIZATION

5. Practising defined "givens' (model building as in the dialogue)
6. Processing and adding some of oneself. (*Expliquez les parfums que vous aimez et Quelles sortes de glaces preferez-vous?)*

Kolb stage 4: Applying

Test B (25 minutes)

The pupil is examined with a partner based on a simulation of buying and paying for an ice-cream. A mark will be given out of ten. A maximum of five marks can be obtained for fluency and accuracy of French. Test B centralises on the last process of the Kolb cycle, namely active experimentation. Convergers and accommodators excel in this type of exercise. (N.B. Test B concludes where test A left off.)

Stage 4 of test B - Active experimentation

7. Analysing appliance for relevance, usefulness.
8. Doing it and applying to raw materials-complex experience.

F. General Evaluation: Interpretations and Conclusions from the test.

Only one girl was absent on the day of the test. The other pupils took test A first and then test B followed. From the results, I can conclude that the mean result 14.83 is much higher than usual. Normally, the mean mark is about 12.50.

Obviously, from employing the learning style processes in my lesson,pupils have learned and retained the material much better than is the norm. Several pupils made tremendous improvements in their work (in both test A and B) which is really encouraging to note. Other pupils advanced slightly in one domain or the other (in the written or oral test). Generally speaking though, the results were much superior to those that I would have expected.

I thought by giving a 'choice' in test A, pupils would answer the two questions which corresponded to their learning style. However, quite a few pupils attempted to answer to all of test. And even though I had stipulated that a minimum of two questions only had to be answered. I will endeavour to see if there is any connection between the questions answered and the pupil's learning style. In order to do this, a tabulation of questions answered will be compared with the pupil's learning style. From this table, one can see by a circle around the question number if the pupil responded to any question corresponding to her learning style.

test A

Pupil number	Learning style	Questions answered
1	Diverger	1,2,(3),(4),5
2	Accommodator,	1,2,(3),5
3,	Accommodator,	(1),3,4,6
4	Diverger	1,(3),5,6
5	Accommodator	(1),(2),3,4
6	absent	1,2,3,4,5,6
7	Accommodator	(1),3
8	absent	1,3
9	Converger	1,3
10	Accommodator	(1),2,3,5
11	Accommodator	(1),(2),3,4,5,6
12	Accommodator	(1),(2),3,4
13	Accommodator	(1),3,4,5
14	Diverger	1,(3),5
15	Assimilator	1,(3),(4),5
16	Accommodator/Converger	(1),(2),3,4,(5),(6)
17	Accommodator	(1),(2),5,6
18	absent	1,2,3,4,5,6
19	Accommodator	(1),3,5
20	Accommodator	(1),(2),3,4,5,6
21	Accommodator/Converger	(1),(2),3,4,(5),(6)
22	Diverger	1,(3),5,6
23	Diverger	(1),(2),3,4,5,6
24	Accommodatoir/Converger	(1),(2),3,4,(6)
25	Accommodator	(1),(2),3,4,5,6
26	Accommodator	(1),(2),3,5,6
27	Accommodator	(1),(2),3,5,6
28	Accommodator	1,2,3,4,5,6
29	Diverger	1,2,(3),5,6
30	Accommodator	absent
31	Accommodator	1,(3),5

The Accommodator learning style had the highest number of people in it and it also obtained the best mean score of 15.81. Next came divergers with a mean score of 12 and finally convergers a mean score of 10. I would really like to compare results obtained in test B among similar learning styles but it is beyond the scope of this assignment. It should

be noted that I allocated ten marks for the simulation (test B) which accommodators are especially good at.
At the time of devising the test, I did realise how unfair I was in relation to other learning styles who do not like this type of exercise namely, divergers and assimilators. Perhaps this is one of the reasons why the accommodators have a higher average than the other learning styles.
All in all, I feel the pupils did very well in both test A and B. An average of 14.83 in a class of thirty one pupils is very good. Questions three and five in test A were answered in a vast majority of the class. On the whole, test B was done very well with the lowest score of five out of ten. This type of lesson is a very worthwhile exercise, it makes one more aware of not only the pupil's learning style but also your own.[1] I am diverger and really enjoy participating in activities involving concrete experience and reflective observation. The majority of this class however, are accommodators. There are times when I have terrible problems with this class concerning discipline. Now, I know that to keep them interested, motivated and amused I need to take their learning styles into consideration when planning my lessons. Since doing this, I have noticed a considerable improvement in discipline, class participation and performance. Not only that but the pupil's work is of a better standard.
To conclude, I feel that this lesson was one of my best with this class- this was illustrated by the high level of participation and performance in the initial lesson. The results of the tests prove that the pupils had retained when they had learned in class two weeks previously. I am definitely considering adhering to the format of the four processes of learning in the future not only with this class but in other classes as well. However, I will only employ it now and again to add variety to the course structure.

G. Reservations and Assumptions.

There is only one reservation I have in relation to the learning style exercise. It is namely the amount of time, thought and effort that goes into planning a lesson which encompasses the four processes of learning. I must have spent about six hours in total between a forty minute lesson plan and devising a test/tests that catered for all learning styles. Unfortunately, I do not have the time nor the imagination to draw up fantastic lessons for every class. This would be psychically and mentally beyond my limitations. What I can endeavour to accomplish though is two lesson plans of this nature every week. Little by little, I can build up my course materials and ideas which has worked extremely well. In this way, I can use these successful lessons again and again as long as they are suited to the pupil's needs and interests.
I think it is vital to assume that one cannot have wonderful lesson plans every day. A teacher has to work within the confines of a vast curriculum and it would be difficult to do this type of lesson everyday due to time constraints. My own lesson plan actually ran overtime. It was only because the pupils had a genuine interest in what they are doing that they did not mind staying on an extra ten minutes. In this case, I was able to keep the class for an extra ten minutes as it was last class before lunch. In normal teaching circumstances, one cannot make this a habit or else one would be late for other classes, not to mention the physical strain involved. I feel a lesson plan involving all four learning styles is a brilliant idea but maybe a little idealistic. We must remember that one can only accomplish so much in a given lesson. With an ever expanding curriculum, it is difficult to cover the curriculum as it is. However, I do believe that in the future, we shall have to consider the pupil's learning styles and adapt our lesson plans accordingly so that the maximum potential from each pupil can be obtained.

[1]The writer submitted a detailed statement of the students prior performance, performance in each test, and comment on changes in performance if any which has not been included in this text.

H. Evaluation of Theory.

As Grasha states 'people do not share the same life experiences and their perceptions of their classes in general undoubtedly differ'. This is what us poor teachers have to cope with according to Grasha. thus , it is important to have a wide range of activities and situations which will interest every pupil. In doing so pupil's motivation should increase to learn the subject as he/she can identify with activities and situations in the lesson. If one goes a step further and includes activities which correspond to different learning types, the pupil should internalise the material better..'Variety' in a lesson is a key to success. The pupils would soon get fed up if the teacher matched their preferred learning style all the time. It is good to aim for a balance in activities, pupils still need to be challenged otherwise they will become bored and switch off. The importance of stretching the pupil to learn is needed in Grasha's opinion. He believes that learning involves stress, tension and anxiety. the lesson I carried out with my class consisted of a little bit of stress to keep the pupil working and alert. The pupils were also exposed to alternative learning styles in order that they could establish where their personal advantages lay.

We must also consider in our planning of a lesson- the subject matter in addition to the learning style and instructing environment The data on career choices and their relationship to Field Independent and Field dependent learning styles indicate that people with certain learning styles probably like different content areas more than others. It has been proven that people's biases and values have an effect on their evaluation of learning styles. Grasha points out to us that the present measures of learning styles are highly loaded on the cognitive dimensions of human functioning.

Cognitive variables are those that influence an individual's acquisition, retention and retrieval of information such as, observation and reflecting of information, forming hypotheses, forming concepts, depth of information processing e.t.c. Second in importance are the social factors unfortunately though, emotional and motivation concepts are not present in the existing learning style typologies. Grasha is not shocked with how the academic researchers view the world of learning styles in terms of cognitive characteristics. However, he states that this bias may hinder them from examining further the vital role that social, motivation and emotional factors play in learning. In addition, the people whom researchers study may begin to see themselves in rather limited ways- in other words, people are led to believe that they have certain preferences for how they learn. This leads to people labelling themselves in a certain way which supports the label put on them, i.e. the self fulfilling prophecy. As a direct result of the self fulfilling prophecy, people start to see themselves in restrictive ways. It is sad to note that the researchers have not even attempted to look for a broader conception of learning style. When one puts a label on someone it can have dangerous long term effects.

Aristotle once said 'What we have to learn to do, we learn by doing'. Aristotle in his statement is speaking generally about learners and how they internalise a given subject. We all learn through practice in other words. I know this is a very basic idea but I feel it holds true for all types of learners. Perhaps, the Myers-Briggs personality test would have been more advantageous in determining learning styles. The Kolb's Learning Style Inventory concentrated far too much on the cognitive dimension to the neglect of social, emotional and motivation factors.

The Myers-Briggs test appears to cover both cognitive factors, for instance, observation and reflection of information, forming hypotheses and forming concepts and interpersonal factors such as, interest in other people, collaboration with others and taking an independent role in learning. Interpersonal variables are those that develop from social interaction- role and role expectations, imitation of models, group norms, leadership and discourse. Therefore, the Myers-Briggs test is superior to that of Kolb's Learning Style Inventory as the former incorporates cognitive and social skills while the latter only embodies the cognitive skills which are far too limiting. [2] I have mentioned before that it is better to aim for a balance in activities as pupils still need to be stretched or else they will

[2]Some students took the Myers-Briggs Type Inventory during their induction course. This writer was one).

switch off. From time to time, the utility of the Kolb' Cycle would prove extremely beneficial. However, I do not think it is wise to use it every day. Pupils need and want variety in their lessons. If their lessons are based every day on the Kolb Cycle, pupils will soon become bored. The key to successful lessons is to constantly surprise the pupils by the use of different aids, e.g. television, video, visual aids, demonstrations, mimes, reading/listening comprehension passages, the list is endless. This can be defined as the eclectic approach which involves borrowing one's philosophy of teaching from a variety of sources. Furthermore, one should ascertain that everything in teaching must be meaningful and have value to the pupil.

Biography.

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