LEARNING BY OBJECTIVES IN A TEACHER TRAININIG PROGRAM: TOWARDS A COMPETENCE-BASED EXPERIENCE CURRICULUM

*Ambaye Tsehay**

Abstract

This short article outlines the preparation of a competence based experience curiculum. It is based on an experiment conducted to groups of prospective teachers at AAU. Six groups of prospective teachers were made 'to experience' their tasks through a proplem–based instructional objective format while six others 'experienced about' these tasks via prescriptive instructonal objective format. Results of the experiment generally suggest that the groups who 'experienced' their task performed better than those who 'experienced about' such tasks.

1. INTRODUCTION

For whatever program they are intended, educational objectives are the basis of curriculum and instruction .Bloom in Waugh, D. (pp.20-21) defines educational objectives as «Explicit formulations of ways in which srtudents are expected to be changed by the educative process. «1 Again, Harlen, W. defines educational objectives as » Statements of intended learnings stated in terms of behavioral (what the student will do, feel and think) and substantial (subject matter in which thebehaviour is to be applied) elements,«2 The problem lies, however, not on the concept itself but on its incompetent use. Macdonald, R in Spiro (1977, pp. 399-412) has indicated that » The major contribution of the learning by objectives is that it encourages pepople to think what they mean when they plan an educational program.«3 More recently, Guilbert, J.J. (1981,1984) has in his articles (pp.38-39; 134-141) respectively pointed out that xEducatioal objectives in an institution of professional training be directly derived from the expected roles of the personnel to be trained in the institution.»4

Different reports on curriculum construction, however, show that, «Different curriculum require differing teaching processes and approaches and such differences interact with student characteristics.»5 Jamison, D. (p.55f). Again Dubin, R. in Spiro (1977, p. 382F) has in his studies on college teaching approaches shown that «teaching methods are approximetely equivalent when the acquistion of information is the unit of analysis in derivng educational objectives .» 6 Mayer and Greeno (1972) have on the otherhand contended that «Differently formulated instructional objectives produce different learning outcomes.«7 (pp.514-22). In this regard, it appears that the content validity and utility of educational objectives as well as the potentiality of a given curriculum depends on the format applied in deriving, formulating and applying educational objectives.

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Content validity contextually refers to the degree of relationship between the the functions of the trainee and the tasks he must perform during training. The utility of educational objectives, on the other hand, refers to their relevance in fulfilling social and pedagogical demands.

Such contentions evoke a useful issue on the design of educational objectives. One can consequently raise the question, should the design of educational objectives be that of deciding what students would know, gathering and prescribing information for them or should it be a question of involving them in the process of constructing and discovering the concept for themselves?

2. Definition of Operational concepts and Their Pedagogical Basis

There seem to be two ways of looking at learning. On the one hand, we have those like Entwistle N.J., 1980 who contend that, The thing learnt was not present prior to learning and comes from an outside stimuli.»8 According to such contenders the learner is to **'experience about'** A given slimuli via memory, mastery, programmed and other prescriptive models of learning. On the other hand, Ausubel, D.P-(1978) contends that, »Learning is understanding by insight into reality, by synthesizing sensations into facts which calls for an approach of experiencing »a given stimuli for oneself through problem solving procedures and thought provoking situations.9 In fact, man is capable of learnings in both ways. The question is however, are there some things that are better learnt by one way than the other ?

R.C. Anderson in Spiro (1977,pp.415-29) has indicated the following merits for the latter learning. He said that, The use of educational objectives in a format involving experiencing for oneself entails better activation of prior knowledge, encoding specificity and elaboration of acquired knowledge for better retrieval.» 10 Swick, H.M (1978,pp.29-68); Klatskty (1980,pp.29-33) have on the other hand stated that, The effectiveness of the learning by objectives is dependent not on the idea itself but on its capacity in interconnecting related processes for better retention and transfer value. »11 This implies that the formulation and application of the idea of educational objectives merits empirical investigation.

When we come to look at learning, in light of these theories we can make some practical conclusions. For those who contened that the thing learnt was not present prior to learning and it comes from outside i.e. from the teacher, the learner is almost passively receptive who *experiences about* a sort of stimuli. In such context, the performer of the task is an external body the learner adhers to learning the content and method of his task in most cases through memory. As for instance a grade 11 student learning English as performed by his teacher conducted either in the language itself or with a constant shift on to the native leanguage, 'experiences about' the language.

On the otherhand, those who see man as different from 'a collection of reactions to stimuli' conceive learning in a totally different way. learning now consists of deciphering patterns and rules in the incoming stimuli and sensations. In such context, one learns by insight into reality, by synthesizing principles and sensations into facts through thought provoking situations. The role of the learner is now radically altered. He takes an active role in *experiencing* the incoming sensations by placing patterns upon them. This type of learning emphasizes on the strands of the solution that are present, in the problem itself. Knowledge turns out to be *experiencing for oneself* how things work. To sumarise the difference the following tables may help.

Learning

In Stimulus Response Theory	In Cognitive Theory
1. did not exist before in the individual	1. was there before as a potential.
2. comes from outside	2. is actively acquired from inside.
3. is under the control of the teacher	3. is under the control of the learner.
4. consists of shaping or controlling behaviour	4. is an organic growth.
5. Focuses on programmed, memory, and mastery models of learning.	5. Adhers to discovery, group and problem-centered learning

So with this grounds and problems of formulating and applying educational objetives, this paper attempts to answer the following hpyothetical questions:

1. Are prospective teachers better oriented of their professional tasks when they 'experience' the teacher training programme task-oriented educational objectives or when they "experience about" such tasks ?
2. What is the prospective merit of each format ?

The experiment has been conducted to groups of Sophomore students at AAU registered for Educ. 211 (Principles of Curriculum Inquiry). The assessement focussed on the significance of two different formats of instructional objectives as applied to the competent use of such formats in the teaching of English.

Competence: According to Vanderschmidt L. Massey, competence is defined as "an attribute manifested by an individual or a group in a particular situation; the ability to carry out a set of tasks adequately, performance which is the actual carrying out of tasks must be measured in order to assess the attribute competence in the performer."He further states that "It exists in degrees and yet it can be measured indirectly as in a test or directly as in observation of a teacher or a pyhsician in an actual setting." 12

The pedagogical basis of the 'experiencing' and 'experiencing about' constructs is mainly to determine the significance of these constructs in practice and thereby outline a rationale and description in constructing an 'experience- curriculum' with suggestive though not yet conclusive operational processes and procedures.

3. Methodology

Following the delineation of tasks and behaviours for the purpose of identifying performance criteria, an experiment has been conducted with small groups of prosepective teachers at AAU (N-102) and the results have been analysed. Pre and post-task performance variance and mean significance among and within groups were examined and compared.

Of the 102 sophomore prospective teachers who voluntered to participate in the experiment, 72 of them were randomly selected and systematically put into a group of six. Such grouping and selection were made on the basis of:

1. Personality types, measured by Myers-Briggs type indicator to any correlation between learning preferences and personality ty
2. Coping with the crowded situations of Addis Ababa High Sch do not allow individual observations to be conducted.

Two methods were used to ensure the comparability of students in Since the University uses a uniform letter grading system, the transcripts ticipants were checked to determine whether any group had a higher p honors students. The proportion of such students in each of the groups to be similar. A pretask test pertaining past knowledge of the content nded learnings of the task under investigation was conducted to determ uping effect and performance comparability prior to the task presentati cated no significant variances. Consequently 36 students majoring in put into 6 groups of equal size and were made 'to experience' their tasks through a problem based educational objective while six others of similar size majoring in physics 'experienced about' their tasks via a prescriptive educational objective.

3.1. Task Formats

Two different formats of instructional objectives were provided to the participants through trigger materials. The task embedded in the trigger material involves process and outcomes as shown in the following table.

TASK	PROCESS	OUTCOMES	
Trigger material on issues related to curriculum	Students hypothesize analyse and discuss using existing knowedge.	Concepts values Skills	Communictive practical intelectual

Task Formats

Problem based format of an instructional objective meant 'to experience'

Six groups majoring in Maths were provided with problem-based educational objectives as in the following:

A student raises the following question to his English teacher:

During the process of learning English for the last few Years, I suddenly felt curious about why I should learn this language ?

As this has repeatedly disturbed my mind, I have become eager to know the relevance of learning this language ?

If you were the teacher, how would you explain and tackle the problem by formulating approproiate objective of your own and the means to attain this ?

1. The first task of the group of student-teachers is to explain the phenomenon in terms of underlying processes and principles. They are to learn how to learn, experience for themselves the 'how' and 'what' of tackling pedagogical problems.

2. Consequently, the group analyses the problem and formulates further educational objectives.

Such problem analysis and formulation of educational objectives involves the following procedures:

a) explanation of interrelated phenomena
b) activation of prior knowledge
c) elaboration of new insights into the problem
d) recapitulation of opinions and formulation of sound hypothesis

3. In the above procedure, general descriptions of pedagogical, philosophical and psycholgical origin are to be advanced. Now the focus of the group will be on preparing a detailed list of possible explanations of the problem secured from the above procedure.

4. Following this, the group formulates educational objectives from the list prepared on step 3, Selects the objectives on which it will concentrate its activities, distributes tasks in finding sources.

5. The fifth step consists of individual study and elaboration of acquired information with respect to the educational objective assigned to them from different sources.

6. The process is completed by synthesizing the newly acquired information.

Prescriptive Format

Six other groups (N-36), majoring in physics were provided with the following prescriptive format of instructional objective.

> After you have observed an actual English lesson in one of the Addis Ababa High Schools, determine the effectiveness of the instructional objectives in light of the social and personal significance of the discipline as handled by the teacher.

1. Following this, the groups were provided with stamped observation forms and covering letters addressed to selected High Schools in Addis Ababa.

2. Students were expected to get the initial and remarks of teacher's as observed and signed on their observation forms.

3. These groups were also supplemented with guiding handouts and other skeletal trigger materials.

Terminal Behavior

Both groups are expected to arrive at a detailed description of the practical, educational and cultural purposes of foreign or second language teaching and learning.

The content of task in both formats is the same, the difference is that the groups dealing with the problem-format are to 'experience' the behaviour involved in the task for themselves, while the perescriptive - format groups would 'exprerience about' the behaviour pertaining a similar task as performed by an external body.

The success and preference of the experiment were evaluated by means of a test and a student questionnaire. The questions required the recall of knowledge and behaviours pertaining to the following terminal behaviour in both formats namely:

1. Derivation, formulation and validating educational objectives at the instructional level.
2. Selection and organization of learning means and methods.
3. Understanding of the organizing threads- concepts, values and skills.

Item descrimination and statistical power of the post-task test was determined by a pre - test with chemistry majoring similar groups who attended the same formats in another phase of instruction. Consequently, items with a mean difficulty range of 65-70% and a mean descriminating power of .48 and above were inculuded in the test. Statistical power of test using J. Cohen's method (1983, p. 714f) indicates a power value of .70-98; acceptable in light of his standarerd value of .80 (for samples >30 and given the brevity of the experiment).

4. Analysis and Presentation of Results

A comparative statistical analysis of the performances of the groups who used the different formats indicate:

1. A pre- task test variance analysis result with no significant differences between groups (F (2,100), 4.86 at .01 level with a computed value of 2.28). Table 1 shows a summary of the pretask variance analysis.

TABLE 1

Analysis of Pre-Task Variance

SOURCE	D.F	ss	ms	F
Among Groups	2	39.2	19.6	2.28
Within Groups	99	848.8	8.6	
TOTAL	101	1240.0		

Insignificant at .05 and .01 level
ss= sum of squares
ms= mean square

As shown in Table 1, the analysis of variance revealed no significant differences between the groups on a pre-task test; F(2,100) ,4.86 at .01 level and 3.09 at .05 level. As the computed F value, 2.28 is less than the upper point of the F distribution at both levels, the hypothesis is accepted . Hence, any difference between the groups prior to the task can be attributed to chance. Following the accomplishment of tasks an assessement was made to answer the following hypothetical questions.

1. Which framework or format promotes significance of achievement with regard to instructional objectives?
2. Does 'Experiencing' the tasks or 'Experiencing about' the tasks enhance the degree of retention and preference for later transfer?

The success of the experiment was evaluated by means of a test and a student questionnaire.

TABLE 2

Presentation of Results

Prescriptive Format N=36		Problem-solving Format N=36	
Scores 30	F	Scores 30	F
10-15	7	10-15	7
16-20	18	16-20	8
21-25	11	21-25	13
26-30	—	26-30	8
TOTAL	654		747
MN.	18.2		20.8

TABLE 3

Analysis of Variance Summary

Source	ss	diff.	M.S	F^{+}
Treatment between groups	120	1	120	7.1
Error within groups	1181		70	16.87
Mean percentages	69.6 (problem based)			
				61 (Prescriptive)

+Significant at:05 level

TABLE 4

Number and Percentage of Pre-Task and Post-task Performance of 102 Sophomore Prospective Teachers

TEST	FORMAT (GROUP)					
	Problem-based		Perscriptive		Lecture	
	No.	%	No.	%	No.	%
Pre - task	36	48.6	36	51.6	30	49.4
Post - task	36	69.6	36	61	NT*	

Statistical power analysis of applied test using J.Cohen's method (1983) indicates a power of 70-98; acceptable in light of his standard value of .80 for samples>30

N/T= Not tested

Analysis of Results

The raw scores of performances on the post-task assessment are given in Table 2. A separate analysis of variance has been made for the performances on each list. Table 3 indicates the analysis of variance for performances on the different educational objective formats. The mean for the problem-based and prescriptive format task groups were 20. 8 and 18.2 respectively. The conditions were similar for both groups except the format of task and that the variance analysis on Table 1 indicates no significant differences in the pre-task test. The mean differences observed were due to the effect of task presentation. This has been confirmed by the variance analysis shown in Table 3.

The F value was found to be significant at .05 level; F (1,70), 3,97 with a computed F value of 7.1. Fisher's Z test was also applied to test the significance of the difference between means. What is more, a comparision of the groups concerned as shown in Table 4 indicates that the problem-based format groups who 'experinced' their task show significantly superior performance.

D I S C U S S I O N

Results generally confirm that those groups that were made 'to experience' their task performed better than those who 'experienced about' their tasks. There are two simultaneously occuring aspects to learning a task; the learning of the content of the task and the learning of the method of the task in concern. It should be noted at this point, however, that the would be teacher is not a mere receiver of educational objectives but a creative planner of such objectives whose main task is the formulation of meaningul instructional intent, selecting means and organizing them to effect instruction. So, in a teacher training programme it is not only the learning of the content of tasks which needs to be emphasized. The prospective teacher needs 'to experience' the method of learning his tasks. This sounds true, for, "knowledge of subject matter alone doesn't guarantee professionalism in Taeching" (Knochel, 1978 pp. 103-150, Azeb Desta, 1982 pp. 27-54).

The small group experiment, despite its brevity, suggests that problem-based presentation of tasks that demand faculty guided independent experiencing for oneself may provide an alternative to lecture dominated curriculum. Such experience-based objectives are, however, dependent on their formulation and presentation or their competent use to create better in erconnection between situations of training and later professional carreer. Klatsky (1980 pp. 29-33) has shown that, "the effectiveness of transfer is determined at the time the information is being learned."[16]

Trainees who experienced the teacher training programme educational objective believe that their experience is useful in activating prior knowledge, in facilitating better encoding and in enhancing the elaboration of knowledge for better retrieveal. This has been confirmed by questionnaire responses of participants (prospective teachers) who reacted as shown in Table 5.

A Summary of Post-Task Questionnaire Responses of Participants Regarding Formats

Number and percentages of 72 prospective teachers at AAU who expressed a preference for task formats regarding educational objectives.

TABLE 5

Opinion Item	FORMAT			
	Problem - based		Prescriptive	
	No.	%	No.	%
1. Task involvement and enjoyability				
—high	26	81.3	14	42.5
—low	6	18.0	6	18.8
—no idea	2	6.0	12	37.5
2. Useful for future professinal task;				
—of little use	12	35	16	50
—no use	4	11.8	4	12.5
3. Level of encoding and conscious performance				
—high	27	79.4	17	53.2
—medium	5	14.7	12	37.5
—low	2	6	3	8.8
4. Degree of elaborating lecture				
—more than adequate	5	14.7	2	6.3
—adequate	28	82.4	19	60.
—not adequate	2	5.9	11	33.7
5. Frequency of instructor-library consultation				
—once a month	14	41.2	19	60
—once a week	18	53	12	35
—daily	2	6	1	3
6. Preferred the small-group again				
—only in pedagogical courses	21	61.8	22	68.7
—in all learnings	12	35	6	18.8
—not at all	1	2.9	4	12.5
7. Levels of task-load				
—less	2	6	16	50
—sufficient	14	41	12	37.5
—more	18	53	4	12.5

According to the post-task questionnaire responses summarized in Table 5, 32 of the 36 prescriptive format groups (88.9 %) and 34 of the problem-based format groups with similar size (94%) responded to the questionnaire. Generally, the responses with regard to the small-group format was in both cases positive. Nearly 97% of the problem-based format groups and 88% of the perscriptive format groups indicated that they would prefer the small-group experience again. Both groups strongly preferred their task format inlight of better encoding and conscious activitiy- But this was highly rated by the problem-based format. Students who were involved in the problem-format further rated their task high with regard to level of enjoyabllity and involvement. Ratings with respect to instructor - library consultions due to task requirements, though satisfactory in both cases show a higher frequency in the problem-based format groups. Degree of elaboration of acquired knowledge via task-oriented educational objectives was again rated high by this groyup (94 %).

Our results and opinion survey indicate a good prospect of perference for problem-based educatioal objectives. Hence, it is reasonablee to conclude that problem-based educational objectives embedded in an experience curriculum tend to have a positive value and are preferred by students in teacher training programme. Such educational objectives are, however, found to be useful only when the prospective teacher is made to experience them during his training. This promotes the student-teacher's awareness of his social, institutional and instructional roles. It appears that by experiencing the teacher training programme educational objectives, the teacher-trainee secures better insight into independent thinking in solving teaching problems.

6. Summary of Recommendations and Conclusions.

The keys to successful programme construction are faculty emphasis on the tasks to be achieved. The basic tasks of the teacher training programme are effective formulation and conceptualization of its educational objectives so as to develop the competence socially and professionally expected of its trainees.

Competence involves tasks, subject matter and behaviors. The tasks of the teacher are mainly social, institutional and instructional while the subject matter component can be put into theoretical and practical catagories. Gange, R., (in Spiro, 1977 pp. 405-415) has differentiated these two aspects and pointed out that "The theoretical category is the knowledge remembered as learnt, while the practical category is that which is transformed in varied situations in one's later professional carreer."17 The third type of 'behaviours' required to perform such tasks involves intellectual, communicative and practical abilities.

The form of tasks provided and the method applied in conceptualizing these tasks again determine the quality of training teachers. Experinces which encourage insight into finding solutions to later professional roles provided through educational objectives meant 'to be experinced' have however, been found to be useful from our foregoing discussions in this paper. This has also been voiced by current literature in the training of professionals. For example L. Klinbergy (1971 p. 21) and Willems, J (1981 pp. 5-21) have strongly contended in their articles that "method and content of instruction which disclose not only the subject matter but also prepare the student for his later roles are worthy in a teacher training programme"17.

The findings and analysis conducted in this paper seem to have some significant implications for our teacher training programmes. At the theoretical level, due emphasis should be given to the professional profile of the prospective teacher in formulating and deriving institutional objectives by our directly or indirectly invol-

ved colleges of teacher education. It is to say that, institutional objectives of the college of teacher education need to include descriptions of functions, activities and tasks expected from the trainees in light of the national educational policy of the country. At the operational level, instructional objectives shouldn't be a summary of an educational programme, nor should they describe the process but the outcome of instruction. The practical implications of our discussion appear to have a bearing on our existing teacher training programmes. Since the simpler statements of educational objectives related only to the student's major areas tend to dominate statments of educational objectives in colleges of social and natural sciences (Though according to the ten year plan on Education in Ethiopia (1983, p. 6-43) the majority of their graduates will continue to be teachers at least for the coming 7-10 yrs.19, it seems necessary to re-examine the content and method of educational objectives in our teacher education programme at AAU along the following lines:

1. Create a balance between the applicative and replicative aspects of the trainee's professional role in the preparation and presentation of educational objectives for would-be teachers. The replicative aspect of knowledge is that which is remembered as learnt and the applicative aspect involves creativity and transfer as used in novel situations.

2. In course construction emphasis be given to the tasks to be attained vis-a-vis future roles rather than only to to the disciplines themselves.

3. The Teacher Training Programme be streamed and the input of professional pedagogical courses be raised to credits 30 as suggested by UNESCO documents on Teacher Education.

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