DOCUMENT RESUME

ED 135 343 IR 004 388

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TITLE The Effectiveness of Feedback in Minicourse/Microteaching in Improving Teaching Skills; A Review and Proposal for Further Studies.
INSTITUTION University of Science, Penang (Malaysia).
PUB DATE 77
NOTE 23p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Behavior Change; Demonstrations (Educational); Feedback; Instructional Media; *Microteaching; *Preservice Education; Research Proposals; Research Reviews (Publications); *Student Teaching; Teacher Education; Teaching Experience; Teaching Skills; *Videc Tape Recordings

ABSTRACT

The use of videotape is a critical element in minicourse and microteaching for teacher preparation, yet its role and function have not been systematically researched. Recent studies examining audience and videctape feedback to explain the effectiveness of minicourse and microteaching obtained inconsistent findings. It is suggested that the mostly unrecognized modelling aspect of videotape feedback could be a useful variable for further investigation of the problem. This paper postulates that feedback modelling via the videotape medium in a perceptual or a symbolic approach could enhance student trainees' teaching skills and performance. (SC)

THE EFFECTIVENESS OF FEEDBACK IN MINICOURSE/MICROTEACHING IN IMPROVING TEACHING SKILLS

(A REVIEW AND PROPOSAL FOR FURTHER STUDIES)

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- 1977 -

One of the major problems in teacher preparation is to give the student teacher the opportunity to gain experience in teaching while still an undergraduate as soon as he has acquired sufficient knowledge to teach. Major solutions towards this deficit situation is by developing theories of teaching and systems for analysing the teaching act. Surprisingly learning theories have been developed but there is still no theory of instruction identifiable.

Research has also been conducted on how to modify teacher's behaviors. It is along this line that the Stanford University micro-teaching program is developed in 1963. Microteaching can be defined as a teacher situation which is scaled down in terms of time and number of students to a 4 to 15 minute lesson. Trainees doing the microteaching are expected to concentrate on a limited number of specific teaching behaviors in each lesson. The early methods involved immediate feedback on teacher effectiveness from the supervisor and 'pupils' (the trainees' peers).

The advent of the video-tape has added a new dimension in the 'art' of teacher behavior modification. By 1968, the term microteaching has been superceded by the term minicourse. This is an adaption of microteaching. Instead of a random lesson, specifically designed short lessons which demands the development of specific skills by the trainees are prepared. Feedback can come from the supervisor, 'pupils' and the videotape. Studies have been conducted to illustrate the effectiveness of this new format of teacher training called minicourse and have predicted high hopes of the video-tape solving the problems inherent in supervision-based microteaching. Unfortunately, as will be seen later on, many of these studies have not

come up with too impressive a conclusion. The reasons for such outcomes will be elaborated later.

Manis (1973)[1] made three assumptions about the skills of teaching. They are (i) teaching may be operationally defined into specific teaching acts (ii) mastery of these skills increases probability of becoming a successful teacher and (iii) increasing a teacher's skill repertoire will enhance his freedom by making him more versatile. Thus it is conjectured that minicourse and video-taping will aid development of these skills.

Borg et al (1969)[2] and Shea (1974)[3] suggested that teachers taking minicourses in conjunction with student teaching will become more effective teachers. They made comparisons of the effectiveness of minicourse in producing significantly greater changes in teacher behaviors than by trainees without going through minicourse.

Johnson and Pancrazio (1971)[4], Collofello et al (1971)[5] and Walters (1974)[6] all recognised the effectiveness of minicourse in teacher preparation and contended that the feedback (video-tape) and the feedback from the audience (the 'pupils') are as important an element in the success of microteaching. An array of questions were asked and tested to come to their conclusions. This displays the variety and innumerable un-resolved issues in microteaching as a technique and minicourse as an extension of it in teacher training.

Borg et al (1969) questioned the degree to which (i) practice in microteaching format and (ii) feedback from video-tape replay influenced

learning of teaching skills.

Johnson and Pancrazio (1971) and Collofello et al (1971) asked if there were differences in the effectiveness of microteaching in the three teaching environments. These being peers, university freshmen, and high school students. Shea (1974) questioned whether teachers taking a combination of minicourse and student teaching could perform the skills required at a significantly higher level of effectiveness than teachers devoting an equal amount of time to student teaching only. Walters (1971) was more analytical and concentrated on whether all or only certain skills can be effectively learned by video-taping and feedback. It can be seen that the investigators failed to partition, identify and delineate the relative roles of each form of feedback and the type of skills to be evaluated and the procedures available in minicourse format. Even with audience feedback, many variables can be identified as well as the immediacy and delayed nature of feedback. As regards video-tape feedback again it can be subdivided into sub-types in terms of time, motion observed, traits and skills displayed etc.

Because of these two major feedback possibilities, independent variables can either be one or a combination of these instances. Thus the five studies under consideration can be grouped into three types, (i) Video-tape feedback (Borg et al and Walters and Shea), (ii) Audience feedback (Collofello et al) and (iii) combination of the two (Johnson and Pancrazio). Each of them are an attempt to recognise the role each specific feedback contribute to teacher preparation.

When the factor of 'effectiveness' is viewed, the investigators

come with different measurements for this dependent variable. It can be in the form of specific teaching skills (Borg et al) e.g. redirection, repetition, answer own questions, student interest etc. It can be teacher rating by means of the Teacher Performance Appraisal Scale (TPAS) (Johnson and Pancrazio). Collofello et al measured effectiveness based on the following observations; these being concept development, student interest, student comprehension, student participation etc. Walters, however, focused his attention of effectiveness upon the trainees' self-evaluation as to whether microteaching play an important part in their program. Shea based his opinion on effectiveness on effective questioning, development of the course objectives and the number of higher cognitive questions.

Even though their dependent variables measured are varied and different, they all measured specific observable skills and thus their conclusions appear to be generalizable. The variables chosen by each researcher are therefore varied and can only be so due to their separate location and profession. They are so chosen only to facilitate a convenience. As these studies are quite recent, it would not be possible for all interested groups in the study of the video-tape in microteaching to focus on a common problem encountered. However teaching effectiveness can at least be attached to the set of educational objectives developed by Bloom et al. Since most of these studies involved the Department of Health, Education and Welfare and the American Educational Research Association perhaps HEW and AERA can dictate the type of study, audience and objectives to be pursued. That this was not done reflects the very thin spread of the fundings of HEW over too many aspects of the questions involved in microteaching at any one time.

Some co-ordination can at least be done by AERA or AECT to define the problems and come to a general concensus as to what priorities to be made. However this is not to degrade the five studies reviewed here. They serve as useful springboards for further research. Though each appear isolated but all add up to present same judgements of the contribution of minicourse in teacher-training.

In Borg's study, trainee teachers are randomised into five groups with two groups attending the complete minicourse and assigned to either the two colleges for student teaching. Another group assigned to college A completed the procedures of the minicourse without the benefit of microteaching and video-tape feedback. A complementary group to that in college B completed the entire minicourse minus video-tape feedback. The control group did not attend any minicourse and was assigned to college C. Not surprisingly, the study, though well intentioned, did not find consistently large changes in the behaviors of those groups in college A and B with the complete minicourse. When compared to their complementary groups, the difference is not significant. This is to say that the omission of the video-tape feedback and micro-teaching practices makes no differences in development of specific skills. The relative differences defined here is on the positive and negative aspects of teacher behaviors, e.g. redirection, number of higher cognitive questions used, prompting, student interest etc. Thus it seem to say that the video-tape as a media is not a critical element in microteaching. When compared to the control group at college C, the trainee teachers with minicourse with video-tape feedback and microteaching fared better. The research did not however point out any difference of the comparison of the minicourse alone

with the control group. If extrapolations were made and assuming that all four groups at the colleges A and B perform as well, then they all, when compared to the control group at C, illustrate a better effectiveness! The chief weakness of the Borg study is the scattering of trainee teachers across three different colleges and that each college receive a different treatment group. The results are thus not exactly comparable. It would seem that if all three colleges receive the five different treatment groups the results may be more valid and comparable.

The problems faced by the Borg group may well be an administrative one and that the colleges cannot absorb so many trainees at any one time. Shea managed to overcome this problem of college assignment of trainee teachers. He had three local schools participate in his studies and have two defined treatment groups. These are (a) control with no microteaching practice and (b) experimental group with microteaching in between student teaching session. The experimental group participated in three minicourses that focused its attention on (a) effective questioning, (b) individualizing instruction in Mathematics and (c) higher cognitive questioning. The control group devoted the same amount of time, that when the experimental group is involved in the minicourse, to student teaching.

Both these treatment groups are assigned to the three schools. During the assigned student teaching periods, the lessons conducted were video-taped. Video-tapes at the beginning of the experiment and at the end of the experiment were screened to a group of raters who were earlier tested for internal consistency in rating. These tapes were rated and each trainee teacher are assigned a score that reflects the effectiveness of the trainee

as a teacher. It would seem that, as the control group spend more time with actual pupils, this would effectively cancel out the effects of minicourse training undergone by the experimental group. Thus this study is a better planned and executed experiment and is supervised recording on video-tape rather than aby the presence of the supervisor. This will remove the element of additional variables placed on the study. The results should thus be in conformity with the researcher's expected outcome. At the lower cognitive questioning level, both groups perform equally well. The experimenter expected a difference in achieving the goal of individualizing instruction in Mathematics. However the results show no significant difference. The most significant improvement is in the level of higher cognitive questioning. The experimental group showed an improvement from 28% to 77% by the end of the study. The control group also showed improvement but at a slower rate from 25% to 37%. Thus the Shea study, while duplicating the Borg study, is better managed and monitored. It illustrates that a combination of micro-teaching and student teaching enabled the trainees to perform certain teaching skills (higher cognitive questioning) at a significantly higher level of effectiveness than those who have not undergone the minicourse with its video-tape feedback. The main weakness of the study is the factor of time. Too short a time of observation was allocated to this study. A linear spread of the study across time would have yielded better results. That the study had not yielded significant results in the ability to individualize instruction as an objective of the minicourse has been ascribed by the researcher as due to shortage of time on the part of the trainees to attend to all objectives of the minicourse. However the Shea study is a marked improvement over the

Borg study in that all the schools receive the treatment groups. Also the lessons were video-taped instead having added problems created by the presence of supervisors who, as explained by Borg, presented an impediment to the trainees as well as to the experiment, and are not fully aware that the trainees were in an experimental situation.

Notably this Shea study is well worth replicating across a longer time scale. Its findings are widely applicable and are both decision-oriented and conclusion oriented in a general sense. This is to say that microteaching as a specialised technique and minicourse as an adaptation can be used effectively with certain limits to the skill in question in pre-service training of teachers.

Johnson and Pancrazio and Collofello et al recognized the problems of conducting experiments in schools situations. So their studies were laboratory based and their focus is on feedback from the environment i.e. the 'pupils' while the video-tape is held constant as an 'instrument' for which the trainee refer to at end of each teaching lesson to improve his skills. Both experiments are identical in using different audience groups. These being high school students, university freshmen and their own peers. The ratings of effectiveness is based upon observing the video-tape by trained raters. These raters have first undergone rating assignments to achieve internal consistency. The instruments used to measure effectiveness are pre-tested first. Both studies are well planned and monitored. The experimental groups are given three trials with video-tape feedback immediately to analyse their own performance. At the last two video-taped lessons, they are assigned to teach a totally new concept so that the effectiveness of the

video-tape as a reinforcer rather than as an example to be imitated upon can be assessed. It may be argued that a totally new concept may not be the right type of method to conduct. The researchers also failed to inform the reviewer whether the new concept taught involved the same skills as the first three lessons. In both studies the control group are the peers acting as the audience. The Johnson study found no significant difference across the treatments and that University freshmen are as good a substitute for high school students in teacher-training institutions.

However this is an averaged conclusion. The analysis of the ratings and treatment preferences showed contradictions that are irreconcileable. All trainees preferred to student teach in front of actual high school students. But at the same time the expressed a preference for their peers as useful critical feedback source. The trainees rate their peers as being more critical and so help to improve their teaching skills.

The Collofello study randomized the treatment groups as in the Johnson study. Here however the evaluation of effectiveness is based on more specific skills to be observed e.g. concept development as measured by student understanding, organization of content, attitude of teacher, choice of words and a host of other skills. Again it come to the same conclusions as the Johnson study. Its findings indicated that if high school students are not available, college students seemed the best substitute for teacher training purposes, using minicourse as a specialized technique.

The weakness of both studies is that they are laboratory oriented and do not in effect reflect actual teaching situations. At best they are a simulation. But at the same time they remove the uncertainties of teaching

in a school situation where so many other constraints have to be contended with. But these studies at least bring back the focus of teacher training to the teacher training institution where pre-service teachers are exposed to teaching situations before grappling with the realities of a school setting. They bring the teacher trainees into perspective and indicate that the institution is where most of the initial foundations be built before sending the trainees to the schools.

The Walters study is a historical critique of teacher training practices with special reference to microteaching. It is an especially valuable study in bringing forth conjectures and conclusions as to the validity of microteaching as a technique and Video-taping as a media instrumental in the trainees acquiring teaching skills not so easily taught by any other means.

The Walters' conclusions are broad-based. It contends that (a) videotape gives students the chance to expand subject matter knowledge; (b) microteaching allows students to get advice from their peers and college teachers and (c) viewing the typical lesson allows students to correct weaknesses prior to their public school appearance, (d) the video-tape file serves as a useful resource, (e) as a result of the complete teaching process being broken down into smaller elements, students are better able to understand the process and (f) students view themselves with more appraisal.

It can thus be seen that conclusions (c), (e) and (f) are not well studied by the four preceding researches. They have concentrated only on overall teaching effectiveness and did not attempt to breakdown microteaching into the components suggested by Walters. Also a glaring omission by the

first four studies is a failure to examine the 'seriousness' student teachers view video-tapes of their own performance. It is along this direction that we can hc to fully exploit the potential of the video-tape.

So although the studies all concluded that microteaching and its derivatives are deisred techniques to be used in teacher training, i.e. they are all mostly decision-oriented, they have not attempted to explain why microteaching is effective. Though none have specifically suggest that the video-tape per se is playing a role in improving teaching effectiveness, most of these studies have however resorted to the video-tape as useful instruments to record and evaluate teacher performance without acknowledging that the same video-tape feedback might have caused the difference, if only slightly, in the performance of the trainees!

The Walters study provides a large format for all the other studies to be based upon and favoured most study on the internal variables within the video-tape recording and also proposed that there are still many other roles not yet identified as posed by the video-tape.

All the five studies acknowledged the effectiveness of microteaching and its adaption, minicourse, in teacher-training but failed to elaborate and analyse further as to the why and how video-taping has helped t. achieve the objectives of improving teacher skills in teacher training.

It is contended that insufficient effort has been channeled into what actually happened as students watch a replay of their lesson or of other trainees' lessons. It is suspected that most of these investigations had left this variable unexplored and assumed that all students will pay the

'necessary' attention to their video-tape feedback. They have not considered what actually should be done with the video-tape feedback! Except perhaps this is a normal procedure to replay the tape in a minicourse!

FURTHER ANALYSES AND STUDIES POSSIBLE

All the studies specifically or vaguely indicated that teaching skills must be identifiable in the same manner as other educational objectives. Conveniently, the studies though at times tried to evaluate teaching skills in terms of type of questions asked, level of student participation etc. and in their conclusions lumped all these observations into that amorphous term called "effectiveness." Are such conjectures generalizable across the studies? Even with the use of student feedback as to whether they felt the lesson is taught effectively, this is oftentimes based on affective domain of the audience and so is suspect. As the video-tape can record all that has happened in the classroom, it is true that all three domains of educational objectives are omnipresent in any teaching situation. What is required is an effective instrument for recording teaching effectiveness and its subsets.

Perhaps certain theories can be developed as to why the video-tape provides an improvement in the teacher training sessions. It is possible that the lack of a theoretical foundation has led to the variety of researches in effectiveness of microteaching. As it is all the studies has made some effort in monitoring the changes that the trainess have demonstrated after going through the minicourse with video-taping, but all have fell for the generalised concept of teacher effectiveness in their conclusions. Shea (1974) may be cited as an exception in recognising that the video-tape is effective in only bringing about the development of only certain skills.

Hence it is questionable if these studies can be compared and said to offer the same decisions to be made about the use of video-tape in teacher training. Is the TPAS rating scale equivalent to the number of higher cognitive questions asked?

A simple minded solution to the 'why' of video-tape as a useful instrument in teacher training is its feedback. Here the feedback can be immediate or delayed. But what is more important is the aspect of feedback called 'modelling'. Even Manis (1973) in the opening paragraphs failed to realize that the video-tape is a medium for which modelling can be operationalized. He contends that the trainees watched the video-tape replay and from there learned the mistakes they have incurred. No one seems to be around to tell the students what exactly they are to look out for in the replay. No studies have come up to the resolution that the video-tape feedback may be reinforcing and not just another instrument per se. But is the video-tape replay just for students to find out what they have done wrong? How about video-taping some other class room programs by some experienced teachers and from there observe what acually happens in a class-room teaching situation and break-down these bits of observations into specific teaching skills? No one study here have suggested that perhaps the video-tape can be used for trainees to model upon.

Hence it is contended that the non-significant findings that the earlier studies have arrived at may be due to the inconsistency of viewing the video-tape as just another machine.

The purpose of this present review is to provide some conceptualization

and conjectures for further research into video-taping as a feedback modelling device. We can generate a few theories for modelling by logical reasoning. By means of conditioning learning theories, perhaps an instrumental conditioning viewpoint can be proposed for the modelling behavior. One learns a specific behavior by observing the model's responses to stimuli either because the model is reinforcing or the learner is directly reinforced as he matches the model's responses. This conception pre-supposes that the model is infallible and knowledgeable in all aspects of the skills he is involved in. This would be a difficult model (pardon the pun) to find. Hence experiments to justify this conceptualization will be difficult to operationalize. Also as Shea (1974) has pointed out, only certain skills can be learned through the use of minicourse.

Bandura (1965)[7] has developed the stimulus contiguity and mediational theory. As the learner views the model, the sensory images he forms become structured and his perception responses strengthened through contiguity. It is also postulated that the learner acquires verbal representations of the model's behaviours which become associated with the perceptual images. This suggests that if the learner verbalizes the model's behavior he will acquire it more easily. By extrapolation if the learner now enact the behaviors of the model the effect is reinforcing. This is equivalent to social reinforcement.

Thus by applying the stimulus contiguity and mediational theory to teacher education, it is conceivable that modelling can consist of two kinds. They are either be perceptual or symbolic. A perceptual model in teacher training refers to a video-taped teaching episode that lends itself

to the behavior to be modelled. In this form of demonstration, a competent teacher is selected and his "total" teaching performance in a regular teaching situation is recorded. The video-tape is then scrutinized and each particular skill isolated and identified. In this way a hierarchy of teaching skills can be proposed. Then the video-tape can be reassembled and use for the teaching of specific skills and the trainees can imitate the procedures carried out by this teacher and then be replicated by the trainees if it were identified as a desirable trait. Of course such procedures must be followed with utmost caution. It is conceivable that the development of the minicourse is an attempt to simplify the identification of these specific skills to be developed by utilizing the second alternative - the symbolic model.

A symbolic model is a written description of the specific teaching behavior to be acquired by the trainee. It is equivalent to a 'cook-book' and like all cook-books, the result may be different with different 'chefs'. Thus symbolic modelling's chief weakness is a concensus for the particular skill to be performed.

The aforementioned models only illustrate that the earlier studies have not focused on this important aspect of the function of the video-tape and in fact the researchers have taken a laissez-faire attitude towards the component of their study in which the trainees are supposed to view the video-tape replay with more objectivity than had hitherto been the practice.

The present review attempts to rationalize the two forms of models so as to present an efficacious system upon which research in video-tape and

video-tape feedback in teacher-training and be centered upon.

A research question that is relevant here, with due consideration to the earlier five studies may be:

DOES FOCUSSING A TEACHER'S ATTENTION ON THE SPECIFIC TEACHING BEHAVIORS MODELLED IMPROVE THE ACQUISITION AND PERFORMANCE OF SUCH SKILLS IN A TEACHING SITUATION?

Here then are many choices and alternatives in operationalizing the independent variables of focusing a teacher's attention on the teaching behaviours (skills) modelled. It can be some or all of the following alternatives:

1. Studying written materials (minicourse) and viewing one's own performance.
2. Studying written materials and viewing one's own performance with a supervisor who identifies and reinforce the desired behavior.
3. Viewing a video-taped model of the specific teaching skill.
4. Viewing a video-taped model of the specific teaching skill with a supervisor who identifies and reinforces the desired behaviour.
5. Viewing a video-taped model of the specific teaching skill and one's own performance.
6. Viewing a video-taped model of the specific teaching skill and one's own performance with a supervisor who identifies and reinforces the desired behavior.

7. Studying written materials only - this is the control group.

All these independent variables can be assembled in a teacher training institution. As the earlier studies indicated that the audience makes no significant difference to the teaching ability of a trainee-teacher, then to hold this variable constant a random group of college students with the same academic training may serve as the audience in the minicourse sessions. By having the six experimental groups, the relative effectiveness and contributions of each component in the independent variable (written materials, own video-tape, model video-tape, and extent of contribution of supervisor) can be thus gauged. In a sense it is a replication of the earlier studies. By removing the experiment from actual school situations, a lot of uncertainties inherent in public institutions are thus removed and the results are comparable across the treatment groups.

With each of these seven variable or treatments, two alternatives will have to be considered. This is whether the skill illustrated shall be of the positive (desired) or the negative (undesired) type. Thus there will be written materials on what is an undesirable skill to practice for say a particular objective. The same is true for the video-tape type. It is hypothesized that learning from positive type model may be a stronger reinforcer than learning from a negative type model. Or it may also be possible that the trainee may react strongly against a negative instance and perform better in the desired direction in opposition to the negative instance.

Therefore there will be a 7 x 2 construct for the independent variable. Should the positive and negative instance makes no significance, then the data can be collapsed into the seven variables.

For the dependent variable, it shall be operationalized as the ability to imitate and successfully perform the positive or desired skill in a teaching situation. The traits to be observed by the rater can be an inexhaustible list. But the following can be starters:

1. Concept development measured by student understanding. Operationalised with a pre-test, test during trial and post-test during the final student teaching session.
2. Organization of materials. Operationalized as to what degree the lesson conducted has replicated the model lesson or the ideal lesson type agreed upon by a group of evaluaters.
3. Number of higher cognitive questions asked.
4. Number of repetitions (a negative skill)
5. Redirection (a favoured characteristic)
6. Prompting (a negative instant).

It can thus be seen both positive and negative instances are used in this study as it is felt that using only any one type all the time may not make the data reliable as any 'normal' teacher will be bound to use an array of such types of skills (to at least provide variety).

To minimize the effect of interference during the experiment, all lesson shall be conducted with the trainee and the audience and the proceedings recorded by remote video camera.

For tabulation of these dependent variable, a group of raters consisting of experienced teachers shall be trained with observations from fixed set of video-taped lessons to ensure that all of them come to an uniform rating procedure. This is to provide internal consistency to ensure reliability of the experiment. When all data are collected and filled into the 7 x 2 cross-break, it will thus be possible to see if a positive and negative instance make any difference in acquisition of skills. Analysis of covariance will allow the researcher to compute the contribution of each component of the independent variables.

This study is expected to be conducted over a longer time scale than the earlier five studies. Also minicourse will have to be prepared well in advance and tested with trial groups before placing them into the experimental format.

If all the procedures suggested above are carried out and the population and groups randomized, the study is expected to yield the following conclusions or as near to it:

1. Modelling as a training variable will be effective for certain specific skills to be modified in the trainees.
2. Video-taped models are most effective when a supervisor provides a discrimination training while the trainee is viewing the tape. (The supervisor shall of course be trained in providing the discriminations with constancy to all trainees).
3. Models featuring only positive instance or only negative instance is less superior than model that provide a combination of both instances.

4. Viewing one's own performance with objectivity will allow for further discrimination of reinforcing the desired skill.

It can thus be seen that microteaching and minicourse as a research question is still not exhaustible. As more light is shed on the aspect of modelling as a behavior, improvements can come about in the utilization of video-tape as an effective training system for teacher-trainees.

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