

Microteaching: Flexible training methodology

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Index Terms: microteaching, active learning , training.

Introduction

Responding to the new learning paradigms and to the ever-changing social needs requires the insertion of new training methodologies as well as the adaptation of traditional methodologies. Proper training demand takes into account the type of audience, their previous knowledge on the subject and their specific needs. Furthermore, it is necessary to attend the interests of the audience to profitably involve it into the learning process.

This paper introduces Microteaching as a training methodology characterized primarily by brevity and flexibility of the training units. This methodology has been developed within the framework of the European project "Microteaching: Modular Teaching and Learning Solutions for a needs based education" funded by the EU Leonardo da Vinci Programme [1]. Finally, the application of the methodology for the training of technicians in the industrial environment is described and assessed.

Microteaching is a way of promoting active learning. It is characterized essentially by its small training units (no more than 20 minutes) addressing some training objectives previously set and well specified. Normally the training includes about 6 training modules with the following aims:

- To involve trainees from the start in the learning process.
- To stress on the concepts, processes and / or skills previously defined and delimited.
- To look forward the internalization of training.
- To cause a subsequent interaction between members of the group formed to develop potential synergies.
- To engage objective changes both in the formation and in the performance of trainees.
- To promote decision making.

Some principles of learning were used as pillars for the development of the Microteaching approach [2]. The two pillars as the basis for the didactical approach were the Taxonomy of Bloom [3] and the Concept of Retention [4]. The Taxonomy of Bloom (see Table 1) shows the incremental process of knowledge development and related competencies.

TABLE I. TAXONOMY OF LEARNING ORDER (BLOOM, 1984)

Competence	Skills Demonstrated
Knowledge	Knowledge Observation and recall of information
Comprehension	Comprehension Understanding information
Application	Application Use of information
Analysis	Analysis Seeing patterns
Synthesis	Synthesis Use old ideas to create new ones
Evaluation	Evaluation Compare and discriminate between ideas

An important issue here is that knowing is not the same as understanding and for workers to be able to apply the freshly acquired knowledge, a one way verbal communication of the essentials is not sufficient. In addition it is true that 'listening' (see Figure 1) is not the best way for transferring information, let alone for

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the development of higher order knowledge skills. These two pillars have been introduced to the participants and consequently been used in the development of the Microteaching approach.

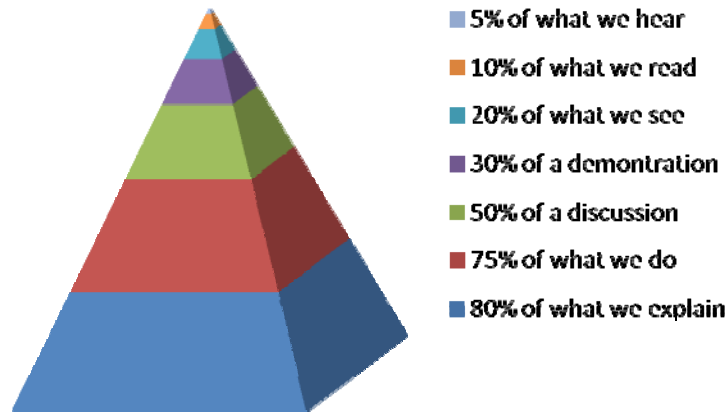


Fig. 1. Survey assessment of every aspect of the microteaching training

Active learning methods share the advantage that employees learn from each other as part of the group communication process. In order to enable effective discussion the group needs to be big enough to represent different knowledge backgrounds and views. If the group gets too big, some members will tend to drop out or become passive. [5].

Results and discussion

The microteaching methodology has been applied in two companies. In both cases, the issue of work is focused on improving the effectiveness of their Environmental Management System. The difference between the two experiences is that the working group of one company (A) was formed by department heads and managers (including the CEO). By contrast, the working group of company B was formed by middle management and technical staff, directly responsible for operators. Company A had the ISO 14000 certification and Company B has just started to realize the importance of improving their environmental management system for the purpose of obtaining such certification.

Once the training sessions finished, the experience was evaluated for both companies. Figure 1 shows the questionnaire facilitated to each of the participants in the microteaching sessions. The evaluation is structured in the following section:

1. Partial valuation of the different training aspects:
 - a. Program: It is important to know the opinion of the participants regarding to which extent they have found the topics of the different work sessions adapted and coherent to their responsibilities and charges.
 - b. Methodology: It is important to assess to which extent the participants in the formation sessions have observed key differences in the methodology, as well as the extent to which the differences could be considered positive.
 - c. Organization: It is essential to know to which extent the participants find effective the format of concise training sessions taking place in their own company.
 - d. Results: It is vital to identify to which extent the training has reached the previous planned targets and to which extent the learning is going to be really applicable in routine work.

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2. Global evaluation module: Strong and weak points of the training. Following the philosophy of the continuous improvement it is important to recognize the point which needs to be improved in the next training microteaching module.

EVALUATION SHEET
COURSE: MICROTEACHING ENVIRONMENT AND SUSTAINABILITY
TRAINERS / ORGANIZERS: UPC
DATES: OCTOBER/NOVEMBER 2006

EVALUATION INDICATORS

	1	2	3	4	5
	Totally Disagree	Disagree	Neither yes or no	Agree	Totally Agree
PROGRAM	1	2	3	4	5
1 The topics discussed were adequate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 The format has allowed flexibility to adapt to the real needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
METODOLOGY	1	2	3	4	5
3 My interest in the classes has remained constant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Active participation in classes has been encouraged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 An atmosphere of reflection regarding the topics covered has been created	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 It is positive to share experiences with others who brings new points view	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ORGANIZATION	1	2	3	4	5
7 It's an advantage to get the training sessions at the work place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 The time use has been enough to achieve the objectives of the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 The short duration of the sessions reduces absenteeism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 The format (data, distribution day...) has been satisfactory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESULTS	1	2	3	4	5
11 The objectives of the course have been clear from the beginning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 The content of the module has been adjusted to my expectation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 I have acquired new knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 The training received is directly applicable to my day to day job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. 2. Survey assessment of every aspect of the microteaching training.

With the aim of measuring the perception of people attending the microteaching sessions and also with the purpose of improving the process, the survey of Figure 1 was anonymously answered by the participants in the trainings. Figure 2 summarizes the compiled information from both companies, A and B. The pondered mark each question has been obtained assigning the weight (1, 2, 3, 4, 5) to the options (Totally Disagree, Disagree, Neither yes or no, Agree, Totally Agree). The measure has been carried out on a whole of 6 participants in each company.

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In Figure 3, the central area has been highlighted in order to help to see more clearly the points where assistants agree (if it exceeds 3) or disagree.

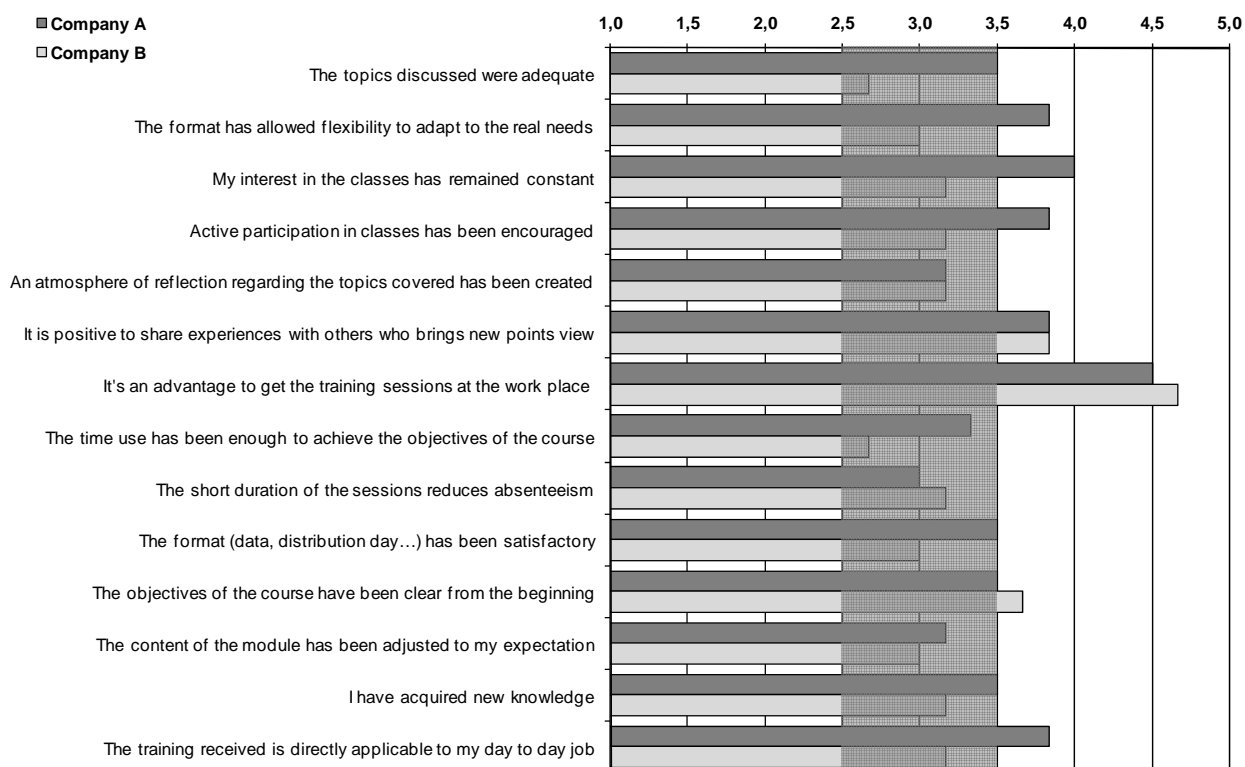


Fig. 3. Overall results of the assessment of the level of satisfaction of the participants. Comparison of the companies A and B.

In general, one might argue that the microteaching evaluation in Company A is more positive than in company B. It is remarkable the degree of agreement on both companies to the assertions "*It is positive to share experiences with others who brings new points view*" and "*It's an advantage to get the training sessions at the work place*". In both companies the participants appreciate that the methodology causes interaction between the group and help to develop synergies. Also the assistants to the sessions appreciate the advantages associated to get the training sessions at the workplace.

Company A, shows full satisfaction in the items corresponding to the selected and adapted program. On the contrary, the participants of the company B found the program not fully adapted to their needs. The program design and scheduling is one of the critical points of the microteaching. The first contact meetings with the company, before the trainings sessions, is essential, because it is the moment when it is specified to whom the training is directed and which are the training targets. A good designation of the above mentioned points almost allows guaranteeing the success in the training.

The results that are observed in the company B for these items are coherent with the disagreement with the affirmation "*The time use has been enough to achieve the objectives of the course*" that again puts in evidence that the design of the microteaching module for this company was not enough adapted to the particular needs of the participants in the training sessions.

Another critical point, in this case related to the methodology, is to favor the participation and to promote the interest of the assistants. Though it is true that partly depends on the experience and skill of the session conductor. When a same session conductor obtains so different results in two companies to the items "*My interest in the classes has remained constant*" and "*Active participation in classes has been encouraged*", clearly in agreement for the company A and in the agreement limit for the company B, the question returns to be the same: Was directed the training to the proper interest group? or also Was the training sessions designed keeping in mind which were the work places of the assistants?, Have the training assistants some

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possibility of improving their work place of work or would they reach some conclusions or offers that are in hands of higher hierarchic level to which they belong? This pilot experience emphasizes the high importance in the training design to ensure its success.

Regardless of the previous observations, the participants of both companies agree with the following items "I have acquired new knowledge" and "The training received is directly applicable to my day to day job", which are key points of any kind of training (especially the second one, for the companies training programs).

OVERALL ASSESSMENT OF THE MODULE										
The rating is the lowest 0 (very poor) to the maximum 10 (excellent). Check it deems the most appropriate.										
1. Rate development of the module in the whole										
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Very poor)			(Acceptable)				(Excellent)			
2. Assess the possibility of a full program of meetings of Microteaching (once every 15 days for one year), compared to attend a training program traditional on the same subject.										
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Very poor)			(Acceptable)				(Excellent)			
MORE FRIENDLY ASPECTS					MORE ADVERSE ASPECTS					
Indicate the most favorable of this course					Indicate scope for improvement course					
1.					1.					
2.					2.					
3.					3.					
LIST OF INTEREST TOPICS										
Indicate which issues require further sessions Microteaching in your immediate work environment										
COMMENTARY / SUGGESTIONS										

Fig. 4. Survey of global valuation of the module

The participants also anonymous answered items regarding a global evaluation of the specific module carried out, Figure 4. The Figure 5 shows the results obtained in each company.

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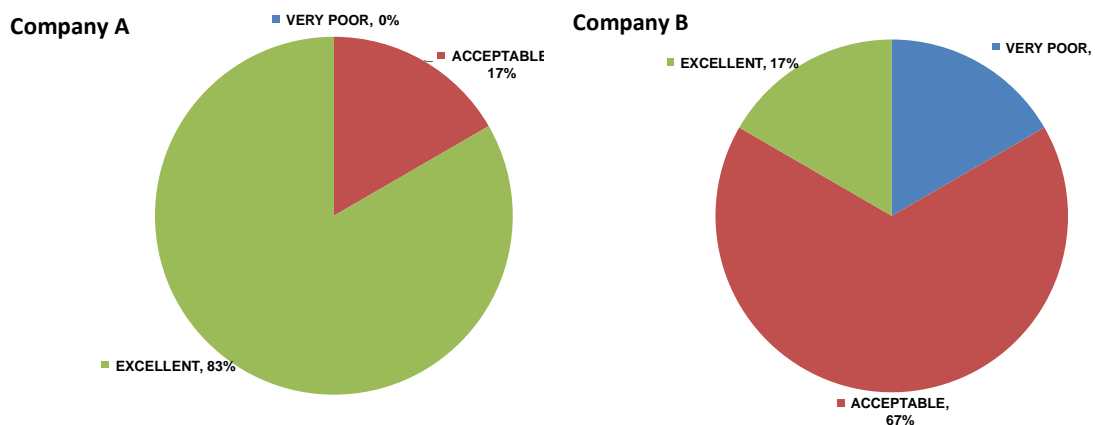


Fig. 5. Global valuation of the module in the companies A and B

Again, company A evaluates better the microteaching training module than the company B. In this point there was revealed the need to be able to compare the microteaching methodology with other training methodologies. The major difficulty to compare methodologies comes in finding the appropriate indicators and in designing the training process leaving from a clearly comparable initial situation. With this goal further studies are required.

In both cases the methodology fully or partially achieved the objectives set. However, it should be noted that several performance differences were observed, easy to relate to the differences between the companies and the working groups in which such experiences were conducted.

Therefore, for future editions, it is required the planning of a set of microteaching actions (included or not in the sessions) for the parties to discuss and approve the expectations, the most significant changes willing to be attained, and the indicators or performance indexes for assessing these achievements.

Regarding the timing of the assessment horizon, three levels should be considered for measuring the effect of the microteaching actions, from the perception of the learning sessions to the resulting undertakings and the final consequences. Thus, the following scheme is defined for the microteaching assessment:

1. Immediate (days): Surveys will be issued to the persons attending the microteaching sessions for evaluating the direct perception of the quality of the activities carried out, the immediate impact on the perception of the need of changes and the way these changes may be achieved, and the expectations for this changes to be fulfilled within the medium term established.
2. Short term (weeks): Forms will be issued for obtaining the list of specific actions undertaken from the “good wishes” declared at the end of the microteaching sessions. Perception and expectations on the changes underway will be enquired after the starting of specific actions, as well as the score for the degree of confidence in achieving the goals.
3. Medium term (months): Forms will be issued for obtaining the results of the actions carried out in terms of established indicators and performance indexes. This request will be addressed to those people in charge of each specific task, who will be also asked for a personal opinion. A short specific survey will be addressed to all microteaching participants for assessing the matching of their perception with the quantitative results.

The retrieval of information should be done in the less disturbing way, so that people being enquired would not be asked for more than a few minutes of their time. This is also an aspect that should be agreed during the preparation sessions with the people involved. Paper sheets, mailing or web-based forms are some of the choices.

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Conclusions

The microteaching has demonstrated to be an effective methodology of building specific learning in a flexible manner and in short blocks. In the concrete case of continuous training in companies, it has shown the effectiveness of the brevity of the modules to allow training to people for whom its permanence in the workplace is essential and have little time for training.

To ensure the microteaching methodology efficiency, three aspects have been outlined:

- The previous meetings with the company in order to design and schedule the training sessions.
- The proper election of the microteaching sessions assistants and the adaptation of the training to them.
- The need of developing proper indicators for assessing the microteaching achievement.

Acknowledgements

The authors would like to thank the Leonardo da Vinci projects “Modular Teaching and Learning Solutions for a needs based education” (2004-146 157) and “Microtraining for effective learning” the economic support to develop and apply the Microteaching methodology.

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