Video recording in university teachers training: benefits and limitations

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***Abstract*—** The video recording technique is considered an important and effective strategy to improve university teaching in novel lecturers. This technique is used in many areas to improve the skills of the people that are recorded. This technique allows to analyze and to evaluate the performance of lecturers in their classroom thus improving their teaching skills and contributing to their professional training. In this work, an experience of video recording in more than 200 lecturers of the Universidad Politécnica de Valencia is reported. It is investigated how video recording helps to identify problems, to analyze the diction and the structure of the lecture and, which is more important, how the lecturer may observe its own action and the perception that students have of him. Furthermore, the common features and implications that were observed in the carried out video recordings are described and discussed.

***Keywords*—** Training strategies, novel lecturers, video recording, observation guide, self-evaluation.

I. Introduction

THE Universidad Politécnica de Valencia through the Instituto de Ciencias de la Educación coordinates the pedagogical and teaching training of lecturers. In this sense, the Pedagogical Initial Training Program (FIPPU) is oriented to novel lecturers which are within their firsts three years of teaching [1]. This Program is carried out during one academic year with the aim of giving support and suitable answer to problems and doubts that daily arise from teaching and which are based on the individual circumstances. This training should contribute to a theoretical frame, a technological baggage and a supervised practice that successfully improve the teaching activity and the later professional development [2].

The Training Program, is understood like “an opportunity of improvement” not like “an obligation”. Therefore, it is tried to support the interest and desire to improve and for that reason focuses its attention in the professional experience of each lecturer and in its analysis and evaluation for later confronting them with the others and to obtain, in this way, ideas and sensations that can serve like model for the generation of concepts and generalizations that can be related to the theory.

This approach implies that the important thing is the experience of each one of the participants which is unique according to the idiosyncrasy of each one. Therefore, the objectives of learning during the Training Program will have to be customized and the support of both the other lecturers that participate in the Program and tutors will be a fundamental piece. Training activities try to be little prescriptives and coherents with the philosophy inherent to the Training Program. On the other hand, the methodology includes different training strategies to provide a wide variety of learning experiences. Among them, the video recording is one of the most important.

Video gives us an additional dimension of information about characters' body language, gesture, facial expressions, stance, response and reaction. This information can be seen more precisely in a video than when it is sawn directly in the classroom because you can see it any times you need and you can go back any time you want to see it again.

The remainder of the paper is as follows. Section 2 presents several related works. The steps that must be followed in order to achieve a good video recording in the classroom are shown in section 3. Section 4 shows our evaluation. The results and implications when the video recording is used as a strategy is shown in section 5. Finally, section 5 gives the conclusions and future works.

II. Related Works

Video recording is a technique that has been used in many university experiences as a way to improve the skills of the people that are recorded as well as a teaching technique [3].

Medicine and topics related with it (e.g. pediatric and trauma [4][5][6]) have been the most application areas where this technique is used. In these cases the video is recorded in order to avoid too many students in the operation room and to

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teach how the operations have to be done while showing possible mistakes. Although the video can be seen by the doctor that did the operation to learn from his mistakes, it is not the main reason to do this recording.

This technique has also been used as a video feedback to teach interview skills [7]. In all of them, the authors conclude that Video is a powerful tool in training and education [8].

But these records are used as a video lectures that will be used to teach in the classrooms or for distance-teaching (placing them in the web server). Recently, the video recordings, jointly with the portfolio, are used for evaluating teachers [9], so video recording is a technique that is becoming very important to improve lecturer's teaching skills.

On the other hand, lecture video recordings are also used for gesture recognition as it has been used in reference [10].

III. Video recording as a training strategy

The video recording made to the novel lecturer is considered an effective strategy to improve the teaching skills. It helps to identify problems, to analyze the diction and the structure of the lecture and, which is more important, allows the lecturer to observe its own action and the perception that students have of him, thus being able to reflect on its way to give the lecture [3].

The process followed in the recording implies the observation and the analysis of the didactic act in the classroom since, as Medley and Mitzel [4] affirmed, in the studies of classroom processes "surely there is not an approach more obvious to investigate on education that the direct observation of the professors while they teach and the students while they learn".

There are a large variety of different approaches on the observation. The followed approach to make this investigation is based on the systematic approach and independent of observation, of the classification of Anderson and Burns [5], where the processes to observe are specified beforehand and the observer registers them through the election of a system of categories that includes most of the aspects and events that take place in the classroom.

This methodology allows making an observation and plural analysis of the performance of the lecturer in the classroom processes. Not to fall in simplifying positions of the multiple dimensions that take part in the teaching activity, it has been used an instrument that besides to reduce the complexity of the process, has meaning in itself and is able to summarize the properties of a whole, the self-evaluation guide, validated through judgment of experts and triangulation.

In the next sub-sections, it will be described the genesis of the video recording, the elements of analysis and the difficulties of putting into practice, as well as the results obtained in the hundred of recordings made to different lecturers pertaining to the diverse schools from the Universidad Politécnica de Valencia.

A. Observation guide

The lecture is considered in its totality like the unit of observation and analysis. Concretely, the analysis is centered in the teaching performance in the lecture and it tries to identify the series of transactions, changes, movements and acts that take place in it. This process is developed in a space (classroom) and in certain time (the time that the lecture takes place, between 1 and 4 hours). Usually the recording lasts one hour, attending to the beginning, part of the development and closing of the lecture. These parts will be considered in the next section.

Three basic dimensions are distinguished in the guide. The first one could be defined as a Situational Context with two levels: the macro context (school and subject) and the micro context (classroom). Different points related to the classroom must be enhanced: size, lighting, acoustics, furniture (location of tables and chairs) and resources (blackboard, slide projector, video projector, etc.). The election of the didactic methodology can depend on all these factors. The second dimension is the Social-Affective Context, which describes the interaction between the lecturer and students. Finally, the third one is the System of Didactic Communication, focused to the observation and analysis of the real processes that take place in the classroom, i.e. what is denominated the interactive phase of teaching [6,7]. The latter is analyzed with the help of the observation guide. This guide considers a double level: on the one hand the phases of the lecture (beginning, development and closing) as well as more specific categories integrated in each phase [8] and, on the other hand, the activities and tasks developed by the lecturer.

Each one of the points of the guide has an observation scale with five levels: 1 Very Inadequate, 2 Inadequate, 3 Acceptable, 4 Adequate, 5 Very adequate. Furthermore, the guide has an area to make observations. In the next section the most important aspects of each part of the lecture will be described.

1) Beginning phase

The initial phase corresponds approximately to 10% of the lecture. The main objective in this phase is to establish the relation within the group, focusing their attention in the selected topic. It is also the moment when the students access the classroom so that is a good moment for the lecturer to clarify concepts explained in previous lesson. The guide values how students attention is obtained by the lecturer, stimulates their interest in the topic, motivates them, connect the arguments with previous lectures, and presents a scheme of what is going to be explained, indicating the objectives, contextualizing the contents, etc.

2) Development phase

The development phase corresponds to 80% of the lecture. Both the expositive clarity as well as the ability of maintaining student's attention and interest are evaluated.

Clarity is evaluated through the analysis of the language used, the concepts used to emphasize, the exposition itself as

well as the sequence of contents. Students learning process is strongly based on their own attention. There is a constant supervision of the assimilation process of students and this is the reason why some aspects of the guide are focused on this. Some of the strategies to maintain the attention and the interest of students are the use of analogies and examples, drawings, schemes, didactic materials, audiovisual media, and the participation of the student in the proposed activities.

The combination of theoretical concepts and exercises, the possibility of solving problems at loud voice as well as asking students to correct are also evaluated and help reinforcing and stimulating their participation and involvement. To finish, the type of didactic material used by students, the use of audiovisuals as well as any no-verbal aspect related to teaching activity of the lecturer is also considered.

3) Document Modification

The closing phase corresponds approximately to 10% of the total of the lecture. In this phase, it is analyzed the way that the lecturer concludes the contents covered during the class and if he makes a summary recalling the key ideas and the link between theory and practice [9]. Furthermore, it is also analyzed if the lecturer reviews notes and asks questions to make sure that everything has become clear. In the latter, it is observed if the lecturer pays attention to the achievement of the objectives defined at the beginning of the class, so that he should also left a few minutes to resolve doubts.

On the other hand, although it is integrated in all phases, is at the end when a proper time management becomes more important, in this regard in the guide there is a point that affects this aspect in relation to the contents taught.

4) General aspects

At the end of the guide, there is a space reserved to analyze general issues related to language and nonverbal communication. Thus, it is considered the control of the speed in the exposition, expressivity, verbal diction, tone and volume of the voice and the verbal fluidity.

Finally, it is also considered the teaching personality and if there is an affectivity in the educative relation as well as the creativity and originality in the classroom.

B. Description of the process

The video recording process is developed through three differentiated phases: planning of the activity, recording of the lecture and its later technical analysis. The attainment of all these phases gives rise to the best advantage of the video recording technique as it allows a critical study before and after the recording has been carried out.

1) Planning

The organization of the recordings begins with the elaboration of an individual card in which the necessary data of the subjet and the group of students are reflected to contextualize the recorded session and that will perform as variables in the analysis of the didactic act: number of credits, weight in the degree, compulsory or optative, practical or theoretical, degree of responsibility, number of students, previous sessions, etc.

2) Recording

The day of the recording, it is registered a general plane of the lecturer and, when required, a view of the classroom or of the students. Existing bibliography around international studies on observation in classrooms indicates that some concepts and variables related to the learning-teaching process are more suitable than others [10,11]. Among them, we can consider the time of the lecture, the organization of the students, activities of the lecturer and students, the resources that are used, etc.

In the guide, which is presented in this work, are introduced fundamental variables for the obtaining and analysis of quantitative and qualitative data. In this sense, different points have been analyzed, like how the lecturer uses the resources of the classroom (blackboard, slide projector, video projector, etc.), the relation that it establishes with the group, the methodology that is used, the control of the time, the structure of the lecture, etc.

3) Technical analysis

Once made the recordings, the pedagogical experts elaborate a technical report taking care of the three key phases of the lecture: the beginning, the body or central part and the closing. Of the extracted data of the guide, the strong points, the weak points and the suggestions are indicated for each one of the above phases. Also, this analysis is made at three levels:

- Individual evaluation: The lecturer is asked to analyze its recording and to elaborate a personal report
- Group evaluation: The individual reflection serves for later contrasting and analyzing the recording with the other lecturers that participate in the Program.
- Technical evaluation: The academic and pedagogical tutors point out methodological and content aspects that need be reviewed

IV. Evaluation

The evaluation of video recording and its reports has to show the quality of teaching and how to improve it. So, it must be focused to establish the main features of performance. For that, it is necessary to determine if the lecture is well prepared and structured. The performance must be clear with a high participation of the students and in a suitable environment. Following these guidelines, a qualitative analysis of results was performed.

Most videos have been recorded teaching during a session based on presential lectures with a range from 20-50 students. The lecturers had established a relation with the group for at least 6 sessions. Respect to the resources, the classrooms had a blackboard and a slide projector. In most cases, a video projector was also available. Therefore, the conditions of classrooms were suitable for a normal teaching performance.

With respect to the teaching process, the results obtained from different planned activities enables to retrieve useful information for each novel lecturer. Observations of teaching and feedbacks sessions using video recording identified strengths and weakness of the teaching activity. A customized list of topics was then obtained in order to improve teaching quality.

Nevertheless, the comparison of revised topics showed that there are not significant differences among novel lecturers. Therefore, it is possible to establish the common features of university lecturers in the initial phase of their teaching activities.

Table 1 summarizes the relevant topics, included in the observation guide. They are classified according to the future perspectives: strong points and points to be improved. Therefore, these topics highlight those areas for being developed by a novel lecturer. Any course devoted to teaching training should consider them.

The main strong points are related to the content and structure of the lecture. The relevance of topics and accuracy of language are properly employed. Meanwhile, the weak points are related to some personal communications skills, the participation of students and the feedback of learning-teaching process. Other frequent errors are related to provide excessive information, high speech rate, the absence of partial summaries and too technical language. Although, the novel lecturers underline the important issues of the subject, they do not emphasize the frequent problems of students in this area. The aim is to achieve an educational and participative activity instead of a conference. Non-verbal communication (body language, paralinguistic) has to be a focus of attention for the refinement of presentation skills. A novel lecturer usually does not employ this tool as a complement to the spoken language.

Since the lecture is the most employed activity in university teaching, the correction of these key topics is fundamental for a course of teaching training. So, the technique of video recording makes easy the identification of the most common errors in a bad lecture. Finally, the feedback sessions must show alternative ways to correct them, using strategies which develop and integrate the teaching skills. Therefore, the evaluation has to conclude indicating how to improve the quality of teaching.

V. Implications

A. General implications

Previous to experience of video recording, the lectures feel threatened by a process which could seem to be judgmental. Moreover, the observation of an only class could be insufficient since it does not really register how it develops the complete student training.

During teaching observation, the presence of video camera and the observer could change the usual performance. Students could behave unusually well and the lecturer is likely to feel nervous about having its teaching practice observed. But, in general, this situation only appears in the first stages of the session. Watching a video of yourself is a valuable experience. This enables to the novel lecturer to get a feel of how the teaching comes across.

Video recording focused in the performance of lecturer has some limitations of learning-teaching process. For instance, it is not possible to analyze some reactions of students. This problem is partially solved with the presence of an observer during the video recording. A professional point of view contributes with additional information that the video recording does not register. This kind of valuable details about two-way interaction between the lecture and students can be discussed in feedback sessions. Nevertheless, the use of two cameras can increase the depth of the analysis. A camera focused on lecturer (speech, blackboard and slides) and other focused on students (distribution, reactions, notes). The simultaneous analysis of both videos allows the detection of problems following the student behavior. So, the lecturer has a disposal for further details which help to clarify doubts or to identify the best strategy for each situation.

The discussion sessions are based on giving a constructive feedback avoiding demoralizing or ineffective comments. It has to consider that there is no one “best way” to teach. But the observation reports and feedback session can provide a useful starting point to improve the teaching quality. So, the contribution of these sessions is double. The more experienced colleague improves the teaching skills in the specific knowledge area and the multidisciplinary sessions provide a refreshing point of view. And, the analysis of other novel lecturers is also a potential way to learn valuable skills. Both observing session is a productive strategy in terms of sharing of ideas for a best practice.

B. Direct results

Table I shows the common observations points among university lecturers in the initial phase of their teaching activities. They are classified as function on strong point or point to improve for each phase of the lecture.

The evaluation of lectures about the experience was also analyzed. After the complete process, the novel lecturers admitted that the video observations are an interesting means of enhancing quality in teaching. It is a valuable experience as part of their training as shown in the following reflections made by novel lecturers that have been recorded:

- “It is a splendid tool to observe yourself as your students see you every day. It enables to know your weak points and to plan the proposals for improvement”
- “Video recording allows comparing your perceptions and the reality of your teaching”

C. Indirect results

The inclusion of an activity of video recording in a course of teaching training has several additional advantages.

The lectures know directly the methodology in order to extrapolate the use of video recording for other teaching proposals. This technique can be applied to supervise

TABLE I
SUMMARY OF OBSERVATION POINTS

	Strong points	Points to improve
Initial phase	- Link the subject to previous learning - Contextualize the topics - Introduce the class in an interesting way	- Secure the attention of the students - Make the learning objectives clear
Development phase	- Underline important/key points - Use relevant examples to make the explanations clear - Adopt a logical and structured approach - Use of learning resources to support the explanations	- Use of adequate techniques to topics - Provide alternative explanations - Explore to assure a correct learning - Make reference to additional situations - Keep student attention - Emphasize frequent errors
Closing phase	- Summarize key points - Identify links with the following session	- Promote on follow up work - Check that the learning objectives has been reached
General aspects	- Control of timing - Speak clearly - Handle students questions appropriately - Provide well-designed materials - Develop a correct teacher-student interaction	- Make eye contact with the audience - Use of non verbal communication - Encourage all students to participate - Relate concepts to students' experience - Module strength of voice

activities based on cooperative learning, academic debates or any educational event. The students can learn from the observation of themselves as the lecturers have done.

Other indirect benefits of experience are to build academic links and to foster innovation. Even, the motivation of students can be improved since it reveals the efforts of lecturer in order to achieve a better yield of the teaching-learning process.

Finally, we have analyzed the issues of this technique which can be developed. Video recording can be applied to review teaching evolution. The evaluation of this process produces a list of topics that a novel lecturer has to improve. Further observations contribute to check the effectiveness of the learning experience. In those cases, there is the opportunity to choose or highlight areas for the observer to focus on. Therefore, the fundamental purpose is to enhance the quality of teaching practice in those topics which were detected as weak points (continuous formation).

Since the observation is one direct source of quality evidence on teaching, this kind of activities are useful for academic evaluations. The feedback given can potentially be used by the participant for promotion purposes of lecturers. In fact, increasing institutions are adopting peer review/teaching observations as a means of enhancing quality in teaching and learning [12].

VI. CONCLUSION

The video recording technique as strategy to improve university teaching, especially in novel lecturers, have been analyzed in the framework of the experience of video recording in more than 200 lecturers of the Universidad Politécnica de Valencia. The methodology, evaluation and implications of the whole process have been described giving the details of its benefits and its drawbacks. Furthermore, it has been shown that although peer observations of teaching and feedbacks sessions using video recording are customized, it is possible to establish common features among university lecturers in the initial phase of their teaching activities.

Now we are interested on studying the relationship between the type of subject (or matter) that is being taught and the lecturer habits during the classroom. We would also like to study if there are common habits between new lecturers in the university and the old lecturers that were their teachers in the past.

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