

Supervision Using E-Portfolios and Its Impact on Student Reflections during the Practicum: a Case Study¹

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Abstract

This paper examines tutorial activity when using e-portfolios and its impact on students' reflections during *Practicum*. More specifically, it aims to compare supervision tasks monitored by means of «dialogic communication» and e-portfolios, as opposed to face-to-face supervision exclusively. We review current research on the impact of e-portfolios on initial teacher education and *Practicum*. In addition, we analyze how *Practicum* has changed as a consequence of the process of convergence, and more specifically as a consequence of the use of ICT to monitor the new virtual space, particularly the use of e-portfolios in teaching practice. The environment of our study was the *Practicum* period at Faculty of Sciences of Education. We have used the information available for five consecutive academic years (2003-2008), taking into account the work of all the lecturers and departments involved in the degree of Primary Teacher Education. The research was possible thanks to the processing and analysis of all the records collected in the technological system. Our practical piece of research is a «Case Study» using a qualitative methodology, focusing on student e-portfolios collected by all the lecturers who were working in *Practicum* at a given time. And within that group, we further study a sample of monitoring jobs during five academic years, collecting and analyzing 1,349 student diaries. The model of supervision analyzed was developed and improved yearly within the framework of Educational Innovation Projects (EIP). The model has kept on changing and is today a first class pedagogical and technological tool. This paper presents rigorous results, and serves to provide practical experience for other projects that aim to experiment and innovate *Practicum* supervision models by means of the use of e-portfolios.

Key words: trainee teachers, *Practicum*, supervision, e-portfolio, dialogic communication, reflection on practice.

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Introduction

Portfolios, and more recently, “digital portfolios” (hereafter e-portfolios) have been widely used in educational institutions worldwide, especially in university level teaching. Their application in the classroom gives rise to a more personalized way of teaching and their role in focussing on students' learning has been well documented in the field. Some scholars even consider that they play a part in facilitating the transition between different educational stages and lead to lifelong learning (Hallam & Creagh, 2010; Barret, 2000; Barret & Wilkerson, 2010).

Two main contributions shape their definition, namely: on the one hand, their capacity to design, organize, take decisions and assess (Bahous, 2008); and on the other, their capacity to collect experiences, reflect upon them and enable students to manage their own learning processes (Hartnell-Young, 2007).

As any other technological system, the possibility of success of the e-portfolios greatly depends on their use as well as how they are implemented in the institutional setting (Cabero, 2002; Salinas, 2008; Aguaded, 2010). At times, their implementation may encounter problems of a technical nature that may merely involve a lack of strategies or that may hinder the accurate weighing up of the efficacy of such strategies; on other occasions, the “technological novelty” (Woodward & Nanlohy, 2004) may cover up the lack of pedagogical use, hence hiding the serious deficiencies of an education and learning which lack in quality.

The transition from paper portfolio to digital portfolio² and its increasing use in the new university virtual environments are not exempt from difficulties. In this context, more studies and impact analyses are required, in order to improve and to correctly apply to each individual case.

The present study tackles the questions of e-portfolios within the particular context of teaching practice (the Practicum), focusing, in particular, on the supervisor's use of e-portfolios to promote students' reflection during teaching practice, as suggested by Zeichner & Wray (2001).

Changes in the Practicum

Among the different changes that have recently taken place in the university setting, it is worth stressing here the increase and quality of the relationships with the business world as well as the social world which are linked to academic institutions. Such a link is not only noticeable in the field of research and scientific innovation, but it has also extended to the field of teaching. It is now commonplace to find student mobility programs as well as grants and internships on offer at all levels (graduate, post-graduate, etc.) in business companies and other related contexts, at hospital clinics, schools, etc. or abroad (internships in foreign companies).

In the same way institutions have made changes to their structures and organization in order to respond to this new reality, teachers are also making changes at all levels to

² In some cases, technical services at universities are separated from one another and poorly coordinated with training services.

what is one of their most important modes of delivery: the tutorial as it appears in a variety of forms (Zabalza, 2003, p.126). This change in the use of tutor-sessions can be linked to a number of reasons which we would like to outline below:

- The emergence of new programs which champion a closer relationship between theory and practice.
- The conception of tutor-sessions and teaching practice as *a link function* in programmes.
- A closer relationship with companies and the “productive sector”, which requires online tutor-sessions. This is a constantly-changing sector where the Practicum has a “chance to increase students’ skills to enter the professional market”, acting as a “linking bridge between both worlds: education and work” (Tejada Fernández, 2005).
- Finally, the conception of the new educational model as one where students can manage their own learning process, and where subjects that are not directly related to teaching are fully recognised. All of these new realities give rise to an increase in the number of virtual environments and new methodologies using LMS (virtual platforms) (Salinas, 2008).

This new situation, which has arisen, demands a qualitative response – rather than a quantitative one - from universities, which is supported by an attention to services shared with teachers. However, occasionally these responses focus on finding a quick solution to the problem, so that the services are momentarily slowed down, instead of focusing on a strategic plan involving the use of technology and teacher training.

At present, supervision with the use of e-portfolios at Spanish universities is being carried out by the teachers themselves, in line with a number of educational innovation projects (hereafter EIPs) (Barberá, 2007; Barberá, Gewerc and Rodríguez, 2009; Gallego and Gámiz, 2007).

As many of the EIPs’ announcements have been promoted by the very same universities, this background has contributed to the current change in universities. Universities are managing the EIPs in a more “administrative” way, but they sometimes struggle to achieve the introduction of these innovative proposals in the regular teaching programmes. Additionally, in the case of e-portfolios, the struggle is at two levels: pedagogical and technological; to which universities sometimes respond separately³.

The Role of E-Portfolios in the Practicum Supervision

Traditionally, the supervision of students during the Practicum has always been conducted by means of a sporadic and permanently disconnected relationship (occasional visits to schools by the supervisors, students’ attendance at university seminars, etc.), as opposed to the possibilities offered by technology nowadays. Fortunately, these habits are changing and technologies are increasingly being used during the Practicum (Raposo, Martínez and Tellado, 2009; Cebrián and Monedero, 2009).

³ In some cases, technical services at universities are separated from one another and poorly coordinated with training services.

Despite the lack of face-to-face learning, good practice has been distinguished among the traditional models. Such practice has improved as technological communication and virtual spaces have been incorporated (Mcnair, & Marshall, 2006). However, good practice varies according to the percentage of in class-learning and online learning. Nowadays, the “blended learning modality” has emerged strongly and it aims to better combine both modalities.

To do so, it is necessary to explore more deeply the research and assessment of virtual spaces as well as the supervision carried out with regard to e-portfolios, as we need reliable data for pedagogic decision making. Innovations usually involve a constant update of new technologies, and in order to standardize such innovations it is necessary to use these technologies in daily practice.

We based our research on a number of results about the impact and the future tendencies of e-portfolios in (1) student learning (Abrami, & Barret, 2005), in (2) the general teaching practice (JSC. Info-Net, 2008; Peacock, Gordon, Murray, Morss and Dunlop, 2010), in (3) teachers (Wall, Higgins, Miller and Packard 2006; Hartman & Calandra, 2007), and especially in (4) teachers’ initial training (Chang, 2005; Ring, & Foti, 2006; McNair, & Marshall, 2006; Ledoux & McHenry, 2006; Agra, Gewerc and Montero, 2003).

Among recent research, we found a considerable increase in the number of studies on initial training, in line with the growth of distance-learning and blended-learning at university (Mayer, 2002; Gallego *et al.* 2009). From the results of these studies, the impact of e-portfolios on learning is here summarized as follows:

- It is an efficient support to help students reflect on their own learning and share their experience with their classmates and supervisor (Qiuyun, 2008), hence contributing to a practice that can be further extended to lifelong learning (Collen and Christie, 2008).
- It allows for a wide range of learning styles to be taken into account and for the teaching to be tailored to the needs of the learners. Teachers follow-up students' work from a range of different codes (online conversations, pictures, videos, etc.), which are used as evidence of learning (Barrett, 2000; Qiuyun, 2008).
- It can combine individualized learning with personalized virtual spaces, with a socializing learning and with cooperative learning. The latter is extremely important in the daily practice of the teacher-to-be, who will have to cope with learning communities, according to Molina Ruíz (2005). According to some scholars, learning communities are the best context to “professionalize” teachers in their initial training (Evans & Powell, 2007).
- It is an invaluable support to assess competence learning, although its validity and level of reliability are not assessed in classical psychometric terms, as pointed out by Meeusa, Petegema & Engelsb (2009). Instead, their functionality is oriented to facilitate students in the analysis of their own learning process, a field where eRubrics have proven to be a complementary tool by facilitating "peer assessment" (Cebrián, 2009), at the same time they are highly valued and used by students and teachers when conducting competence assessment (Martínez & Raposo, 2010).

In sum, e-portfolios are highly useful to offer support in *formative assessment* and within the *constructivist approach* to teaching and learning.

Using E-Portfolios in the Supervision of the Practicum in the Spanish Primary Teacher Education Degree

The *e-portfolio for supervision* project started in 1997, and has been developing ever since, thanks to Innovation Projects and further research grants. At first, a common programme for all teachers from different Departments involved in the Practicum (Spanish Primary Education Degree, Faculty of Educational Sciences in Spain) was created. Later, in the academic year 2003-2004, a virtual environment was implemented, and this gradually became, in the 2005-2006, an *ad hoc* environment which allowed the development of the Practicum: an *e-portfolio*.

The innovation projects have progressed over time and have improved the model both pedagogically and technologically, providing an ideal framework to develop a research line on the ITs in the Practicum. As a result, several studies have emerged, such as the one presented below.

Dialogic Communication and Practice during Supervision of the Practicum by Using E-Portfolios

The same questions that were used to dynamize former innovation projects and to formalize the objectives of the present research were also used to solve doubts about the supervision of e-portfolios in this research.

General Objectives

- To understand the different practice teachers implement when supervising the Practicum with e-portfolios.
- To see how *dialogic communication* and the use of e-portfolios by supervisors affect students' reflections on their own practice.

Specific Objectives

- To analyse the different supervision practice when using e-portfolios.
- To analyse the path of the different supervision practices over time.
- To analyse the impact of the different supervision practice on students' reflections on their experiences during the Practicum when e-portfolios and *dialogic communication* are involved and when they are not.

As observed from above, the main aim is to find out the supervising possibilities of e-portfolios in the Practicum, in the Faculty of Educational Sciences, from 2003-04 to 2007-08. The ultimate aim is to understand the impact supervision with e-portfolios has on students' work during the Practicum, in terms of the type and level of reflection, together with the topics suggested by students. The differences between supervision with e-portfolios as opposed to the *traditional model*⁴ are analysed within a programme shared by all supervisors (including objectives, activities, competences, assessment criteria, eRubrics, etc.).

⁴ A "traditional model" understands supervision as supervisors' regular visits to schools and students' classes at the Faculty without using any e-portfolios.

Methodology of the Study

The framework for the present study is a *Case Study* which uses a qualitative methodology, consisting of a research group composed of all teachers who had worked on the Practicum for 5 consecutive years. Within this group, a detailed and exhaustive follow-up was carried out on one particular instance of supervision during that time.

The methodology here aims to analyse differences in students' reflections by means of their diaries, according to the types of supervision found in this case study, namely: supervision with and without e-portfolios; and supervision with and without *dialogic communication*⁵. This, together with the objectives and methodology, is partly the reason why the qualitative analysis techniques - observed from the analysis design and the use of diachronic and synchronic dimensions – have proven to be clearly in line with the *Historias de la Vida* work developed by Bolívar, Fernández and Molina (2005).

Supervisors' Profile

In order to better understand the context, it is important to outline the profile of the five supervisors who participated in this research:

- Teachers A and B only supervised through virtual environments with e-portfolios. They both had teaching experience in the use of virtual environments. However, it was their first time using e-portfolios as a method. In the data collected by the present research, only supervisor A carried out a *dialogic communication* with his students, through a private online communication tool that was available to all supervisors in the e-portfolio, within student diaries.
- Teachers C and D did not provide personal responses to diaries. They only used an open online forum to answer group inquiries, and it is their first time using virtual environments with this type of e-portfolio. They also used in-class sessions at university and school visits to complete supervision.
- Teacher E did not use e-portfolios and carried out supervision exclusively by means of in-class sessions at university and school visits.

Data Collection

Each diary was a maximum of one page long and was collected once a week, so that by the end of the practice period, an e-portfolio was made up of 8 to 14 diaries. The minimal units of analysis were extracted from these diaries, e.g. a sentence or paragraph expressing an idea or a feeling, or describing an action.

E-portfolios from other teachers' students were disregarded, given that they participated only occasionally in this research (one or two consecutive years at the most) and with the purpose of getting teaching credits in the Practicum; so that there were no real guarantees that they would supervise the same way. Having said that, the five selected teachers accounted for over 80% of the total number of e-portfolios used in the supervision.

⁵ By "dialogic communication" it is here understood the written communication that takes place between students and supervisors, by means of student diaries.

Sampling has been possible thanks to (1) Supervisor A's responses to his students' diaries from year 2003-04 to year 2007-08; and (2) All student diaries of supervisors who followed on the same methodology during year 2005-06, except for supervisor B, for reasons beyond this research. However, student diaries of supervisor B were used during the years 2006-08. The academic year 2005-06 was selected because it was the first year for all supervisors to use the e-portfolio.

In order to meet the objectives, we used data based on the following Table (I):

Objectives	Year Objectives	Collected Data	Number of ePortfolios	Number of Student Diaries	Number of Units of Analysis in Student Diaries	Number of Units of Analysis in Supervisor Responses
1 y 2	5 Years (2003-08)	Number of Supervisor A's Students' ePortfolios	66	632 (plus supervisor's response)	461	202
1	2 Years (2006-08)	Number of Supervisor B's Students' ePortfolios	38	362	273	-
3	1 Year (2005-06)	Number of Supervisor A's Students' ePortfolios	19	304 (plus supervisor's response)	201	96
3	idem	Idem Supervisor C	15	162	106	-
3	idem	Idem Supervisor D	10	97	97	-
3	idem	Idem Supervisor E	12	96	96	-
Totales			141	1349	993	202

TABLE I. E-Portfolios, Total Amount of Diaries Collected and Minimal Units of Analysis by objectives

Instrument and Sample

Students were not asked what they thought of the supervision carried out with predetermined instruments and categories, unlike the work carried out by Cameron-Jones & O'Hara (1999) among many others. Neither have we started from categories nor instruments that were already tested, such as the categories used by Deuchar (2008)

for supervision styles (*laisser-faire*, *pastoral* and *directorial*). This is because the objectives and methodology of this research aim at describing the practice while it takes place, hence extracting - rather than applying - the observed categories for their subsequent analysis.

A number of diaries were selected randomly from an alphabetically ordered list based on natural years. Such a list included 141 e-portfolios with 1,349 diaries, which accounted for the total research population. From it, 40 e-portfolios and 382 diaries (28.31% of the population) were selected for the present research. The e-portfolio and diary sample produced 993 minimal units of analysis in student diaries and 202 units of analysis in supervisor A's responses to diaries.

The seven researchers analysing the diaries⁶ - who were unfamiliar with the supervising process subject to study - were geographically distributed along the Spanish national territory, so we opted for elaborating an online data-collection and analysis instrument. With this in mind, we created a web-based instrument using the LimeSurvey free software. The instrument was adapted based on the common analysis of several pilot e-portfolios, from where researchers extracted the texts and assigned the categories, until creating a definitive instrument and reaching a consensus after three consecutive phases. Then the e-portfolios were distributed among the researchers who used this online instrument to collect the selected minimal units. After that, the SPSS statistical package was used to analyse these minimal units.

Each researcher carried out a categorization of the diaries within each selected e-portfolio. The resulting categories from the analysis of the pilot e-portfolio were as follows (according to the supervisors' responses):

- Supervisors' responses include socializing factors, including categories such as *socializing*, *communicating* etc. and sub-categories such as *with other students*, *with the centre tutor*, etc.
- Supervisors' responses encourage personal reflection, with categories such as *describing*, *analysing*, *arguing*, *contrasting*, *comparing*, *deducing*, *discussing*, *asking*, *searching for information* and *sharing information*. These categories might have associated some sub-categories such as *revising theoretical information* or *empirical studies*, *showing preconceived ideas*, etc.
- Supervisors' responses motivate students, and lists categories such as *motivating*, *reinforcing*, *supporting*, *rewarding*, *understanding*, *integrating*, *empathizing*. These categories might be associated with some sub-categories such as *verbalizing reflections*, *telling experiences*, *describing achievements*, etc.
- Supervisors' responses offer advice, and include categories such as *accompanying*, *teaching* and *answering*. These categories might be associated with some sub-categories such as *advising on how to describe facts*, *reflecting*, *keeping the diary and the Practicum up to date*, *asking for clarification to improve communication*, *explaining and teaching concepts, terms, techniques*, etc.

⁶ All the researchers were doctors and professors of the Practicum in different Faculties of Educational Sciences in Spanish universities. Likewise, they had all contributed at some point and participated regularly in the scientific events on the Practicum held in Poio, Pontevedra (Spain).

Synchronic and Diachronic Data Analysis

Figure I shows the design of the *diachronic analysis*, which allows us to know the supervision A model (Objective 1), not only in relation to its progress over the academic years right up to the present time but also in relation to its progress within each year (Objective 2). Also, the diachronic analysis enables us to know supervisors' responses to students over time.

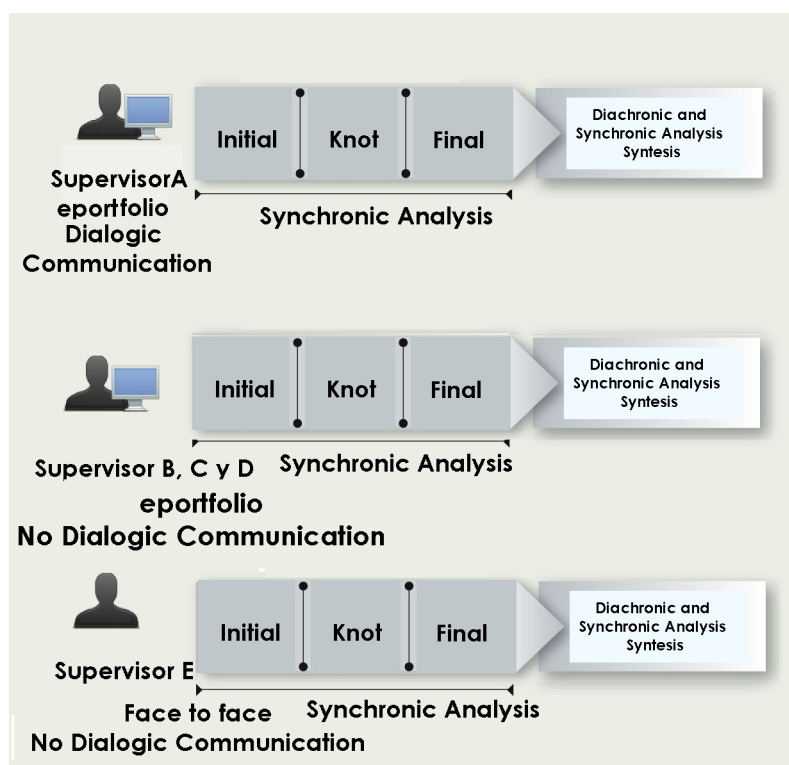


FIGURE I. Diachronic and Synchronic Analysis Design

Synchronic Analysis enables us to compare all supervisors' responses to their students' diaries both when there is (or is not) a dialogic communication in the diaries and when e-portfolios are (or are not) used (Objective 3).

Data Analysis and Results

Given the dimensions of the present study, we will try to summarize as much as possible the amount of results obtained from the data analysis, by selecting only those that are most significant to the objectives outlined.

Objective 1

66 e-portfolios were analysed for this objective. They belonged to Supervisor A's students, who had a total of 632 week diaries, from which 461 units of analysis were extracted and 202 minimal units were analysed from the supervisor's responses.

- From Supervisor A's responses to his students across all academic years, we found the following categories on average: 39.8% motivation, followed by 26.9% encouragement of reflection, 24.4% offer advice and 9% socializing learning.

From the above responses, we conducted a qualitative analysis of the most remarkable ones:

- The Supervisor encourages students to upload their experiences to the online forum, regardless of whether they are positive or negative, with the aim to dynamise individual and collective experiences. This strategy has changed over time, as it will be further observed.
- The Supervisor encourages students to search for references or specific literature (e.g. techniques to teach their students) in order to expand their knowledge and to contrast theoretical texts with personal experiences in the teaching practice. The Supervisor sometimes helps students find texts.
- The Supervisor is constantly asking students to reflect on the facts that they are describing and experiencing. Supervisor reminds students that it is preferable to describe a few facts with a wide range of elements for analysis and reflection rather than describing one fact in detail or narrating many anecdotes, which is a common tendency among students. This approach has been clarified over time.
- E-portfolios allow a fast communication with school tutors by means of students. Students convey their supervisor's messages (expressing support, gratitude, appreciation, etc.) to their school tutors. Likewise, tutors reply to these messages very quickly, and this communication is shared with the whole group through the online forums.
- The Supervisor is constantly asking students to polish their written expression in order to achieve a professional language and a good communication overall, as students' lack of experience in creating e-portfolios and reflecting on texts is quite noticeable. Such lack requires a lot of effort from students in the first stages, hence delaying the achievement of a deep reflection and a polished text.
- Supervisor A sometimes asks students directly about terms or concepts, as a strategy to make up for the afore-mentioned lack of experience, given that the students are initially (initial phase and knot phase) more encouraged to narrate and describe the facts rather than express their feelings, thoughts and reflections on facts. By using direct questions, the supervisor is putting reflections in students' heads, hence achieving – although only occasionally - a deeper and more polished text and debate in the knot and final phases.

Objective 2

- Over the course of the five academic years, there is a significant change in Supervisor A's model. While he *encouraged reflection* and *offered advice* (40% in both) in the first years, he rarely *encouraged the socialization of experiences within the group* in the last years.
- The category entitled '*Encouragement of reflection*' gradually decreased (down to 22.3% and 26% in the last two years respectively) together with the category *offer advice* (down to 25% and 26.7%), whereas *motivation* and *socialization of*

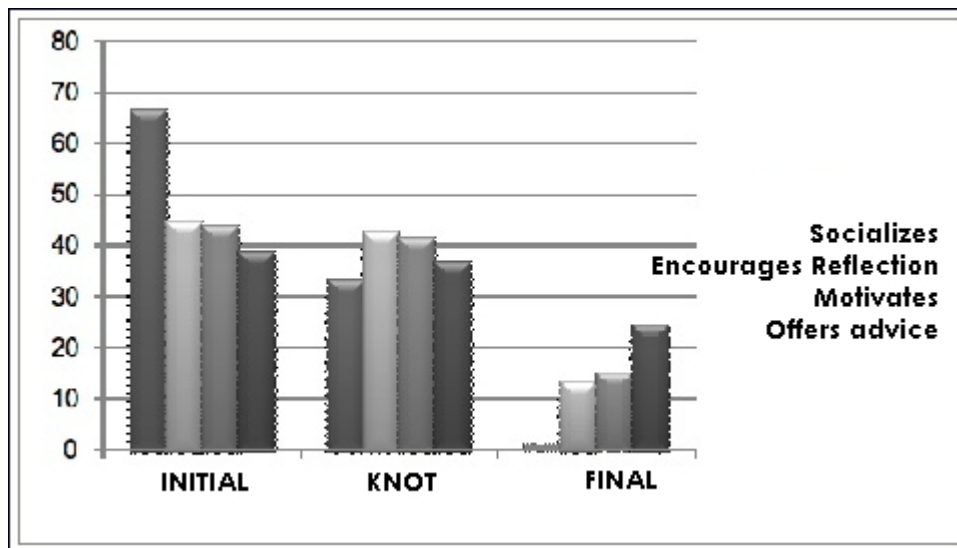
learning experienced a constant increase across all of the years (up to 46.3% and 40% in the case of the former and 0 to 26.7% in the case of the latter).

- This accounted for a strategy shift from a *personal tutor* to a *socializing tutor*. The ultimate aim is to create a “practice community”, which is *motivating* for students and *bearable and real in terms of investment time* for supervisors.
- When observed within the same year and as an average of the five years, these changes made by the supervisor also give rise to data that shows a consolidated strategy.

At the beginning and during the first days of the year (initial phase 3, first weeks), the supervisor tries to *socialize learning* (with 66.7%) over the other responses: *encouraging reflection* (44.5%), *motivation* (43.9%) and *offering advice* (38.8%).

In the intermediate phase (weeks 4-8), the supervisor's responses are similar (33.4%; 42.7%; 41.4% and 36.8% respectively according to the above order). In the last days (weeks 9-14), there is some evidence of the category *offering advice* showing at 24.5%, while there is little evidence of the categories *encouragement of reflection* (13.1%) and *motivation* (15.1%), there is no evidence of the category *socializing learning*.

As observed in Graphic I, the defined strategy aims to create a “practice community” first, and then a united group to share experiences. Once this group is consolidated, the strategy would simply involve encouraging its members to maintain it and offering advice during the last critical moments before the end of the academic year.



GRAPHIC I. Changes within the same year and average of the five years.

Objective 3

Supervisors A, C, D and E’s students’ e-portfolios (belonging to the academic year 2005-06) were analysed for this objective. A total of 56 e-portfolios (belonging to the same number of students) were distributed among the teachers, according to the teaching credits. 659 diaries and 500 units of analysis were extracted.

- The number of diaries and units in Supervisor A's e-portfolios is higher than in any other supervisor. The averages per e-portfolio were as follows:
 - Supervisor A: 16 diaries on average per e-portfolio and 10.57 minimal units of analysis per e-portfolio.
 - Supervisor B: 10.8 diaries on average and 7.06 minimal units.
 - Supervisor C: 9.7 diaries on average and 9.7 minimal units.
 - Supervisor E: 9.6 diaries on average and 9.6 minimal units.
- The fact that Supervisor A has a higher number of diaries and minimal units is due to the fact that he replied to all diaries with a message one to three times per week (depending on the number of diaries he received). These messages were at the same time replied to by students, so that the volume of produced text increased. All of which makes us think that there is a lot of writing work, comments and debate in Supervisor A's students' e-portfolios and diaries. This is likely to be because of Supervisor A's differentiating model. This model may have elicited a strong commitment from students in the *dialogic communication*, as they may have felt obliged to improve their written language and pedagogical thought. Therefore, the *dialogic communication* variable is thought to produce a differentiating impact on learning and a conceptualization of students' practice. These differences are more noticeable in Supervisor A's student diaries than in Supervisor E's.
- The above results are backed up by the data on the different topics presented by students. In the *reflection* category there are important differences such as:
 - Supervisor A threw up 40 minimal units accounting for 21%.
 - Supervisor C threw up 29 units accounting for 33.33%.
 - Supervisor D threw up 25 units accounting for 29%.
 - Supervisor E threw up 21 units accounting for 45.6%.

Therefore, Supervisor E's students devote proportionately more time to reflection in their diaries. However, the present results can be incorrect if the type of reflection and the reasons for it are not analysed in detail, especially in terms of time:

- Firstly, the higher percentage in E is related to the percentage of minimal units within the total number of minimal units collected from each supervisor's diaries. This is why, in spite of these differences, Supervisor A's students show a higher number of units (201 in total) in year 2005-06 than any other supervisor's students. This includes the *reflection* category, where Supervisor A threw up 40 units (double than Supervisor E), although the latter doubles the percentage of the former. However, it is worth noticing the differences in the number of e-portfolios that were collected and analysed: Although Supervisor A does not double the number of e-portfolios, he does show important differences in terms of number of diaries and significant minimal units observed, so that he shows a higher relative production than Supervisor E:
 - Supervisor A: 19 e-portfolios, 304 diaries, 201 minimal units;
 - Supervisor E: 16 e-portfolios, 96 diaries, 96 minimal units.
- Secondly, if we compare students' reflections on the presented topics (subcategories and contexts), we find that Supervisor A shows a higher range of topics and level of reflection than any other supervisor. Such is the case of the

deduction category, which refers to deductions and further consequences of learning extracted from one or more reflections on a complex topic.

- By conducting data analysis, we can observe the percentages of all subcategories, namely: *analysis* (10%), *argument* (6.9%) and *deduction* (4.1%) from a range of different topics (feelings; daily routine; resources and materials; activities; events; students' attitudes; the teaching career; teachers and students relationships; methodological strategies; experiences of other Practicum students; and the purpose of their own reflection). In contrast, Supervisor C and E's students did not throw up any minimal unit of analysis in the *deduction* category, whereas Supervisor D's students did.
- Thirdly, if we analyse the change in the type of subcategory over time, there are more differences between Supervisor A and E. Supervisor E distributes reflections only in two subcategories: *analyse* (17%) and *argue* (31.7%). Within them, the context of such reflections is as follows: *context* (8%); *feelings* (10%); *daily routine* (10%); *resources and materials* (8%); *methodologies* (14%); *students* (3%); *activities* (12%); and especially *methodology* (22.2%). The latter differences are particularly explained by the different students' topics and the different phases within each academic year, especially with those mandatory activities that were suggested to all students in each academic phase. This shows that Supervisor E's students use the diaries to argue or analyse – and to describe – their didactic units as they are elaborating them, focusing on justifying their methodology, in order to get a better grade at the end of the academic year. However, they are missing a deep reflection that would lead them to analyse and deduce the consequences of their experiences; unlike what we see in Supervisor A's student diaries due to the range of topics and the level of reflection achieved.
- The three phases (initial, knot and final) differ within the same academic year, especially between Supervisor A and Supervisor E. In the former case, student diaries are equally distributed over time (initial 27.6%; knot 37.2%; and final 35.2%), whereas in the latter case the diaries are concentrated at the beginning (initial 79.6%; knot 13.2%; and final 7.2%). We believe this is because students were obliged to attend three in-class seminars at the university in the first month, so that the supervisor seized this opportunity to provide them with input in class. Differences with Supervisors C and D are not significant. We believe this is because Supervisors C and D's students were assisted in the use of e-portfolios, where they got answers to their questions and clarification through the public online forums where they all participated, regardless of whether they were students or supervisors.

Constraints of the Research

On the one hand, whereas only the *dialogic communication* of one supervisor in his student diaries was analysed, there is further communication in the e-portfolio (forums, notes, emails, videoconferences, etc.) that was not analysed and that could have provided a higher level of understanding and explanation in terms of the results.

On the other hand, this case has been interesting to study due to the amount of data and the time length (5 years). These results are backed up by similar results in other studies, in contrast to the potential constraints of the present case study, as stressed by the work of Dow, Hart and Nance (2009) who found: “a statistically significant agreement between supervisors and supervisees in relation to the topics discussed in supervision and to the supervision style”. Despite this, it would have been interesting to count on an observation record and a data analysis on the “face-to-face” answers provided by Supervisor E to his students beyond e-portfolios, which are likely to have had a great impact on them. Such analysis would have led us to a better understanding of the differences found in this study.

Given the dimensions of the present research study we have only shown the results from the supervisors’ perspective, disregarding the students’. Although the data from Supervisor A’s student diaries over the five years and the rest of the supervisors’ in the academic year 2005-06 were analysed, these data were only used to check students’ replies to the different supervising practices, so that many other data in student diaries remained unanalysed. Given that we only studied the student diaries, there are no further results on the perspective and progress of students over time nor in the e-portfolio practice. We understand that the e-portfolio perspective together with all student diaries would have provided us with an overall perspective. Also, it would have given us insight into the process through which students build their e-portfolios as well as the difficulties they encounter during the Practicum. Nonetheless, it would be interesting, in future research, to establish work groups aimed to find out about students’ assessments and to engage them to analyse the *dialogic communication* with their pupils.

Conclusions

There are significant differences in the number of reflections and topics suggested by students in the e-portfolios, according to the different supervising methods that were analysed in this study. Such differences have been most significant when comparing the use of e-portfolios to the “traditional” methods. There are mainly two reasons for such differences:

- The amount of written text and debates among students, due to the *dialogic communication* carried out along each academic year.
- The communication possibilities offered by supervision with e-portfolios.

Due to the above reasons, we can conclude that the *dialogic communication* has led to a differentiating impact on learning and on the conceptualization of student practice. Such differences were more noticeable in the student diaries of those supervisors who used e-portfolios than in traditional supervision models.

The EPIs funded research has greatly contributed to the evolution of this model, and has become a valid training methodology. This has enabled teachers to make progress, by making constant improvements and creating a more sophisticated practice model, both pedagogically and technologically. The analysis of the *dialogic communication*, the synchronic and diachronic analysis techniques, the changes made over time and the variables that have caused such changes have all contributed to the development of the Practicum supervising model.

Therefore, as a content analysis technique, e-portfolios have turned out to be a valid procedure to understand supervision during the Practicum, as well as other techniques involving a mediation between the teacher and the learner through the use of technology.

In order for e-portfolios to improve the learning process during the Practicum, it is necessary to count on a supervision model that understands how students build their practical knowledge through the use of technological resources.

This requires new competences from teachers, in relation to a supervision methodology based on e-portfolios and formative assessment, which values process and product equally. Likewise, it requires a more responsible and reflective attitude from students, in relation to their own learning. Finally, it poses strategical requirements and resources to universities; such as an appropriate number of students per group or more personalized support to teachers (both technically and pedagogically).

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