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# Study on the Collaboration between University and Educational Centers Mentors in the Development of the In-School Education Placements in Official University Degrees Qualifying for the Teaching Profession: The Case of the University of Santiago de Compostela

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**Abstract:** An in-school education placements is considered a crucial axis in the training of the future teacher. This first immersion in the school context allows interaction between theory and practice, contextualized learning of the profession and reflection on the processes, skills and competencies to be acquired, as well as the student's personal development. The successful achievement of these goals requires close collaboration and communication between all the agents involved in the internship: university mentors, school mentors, and the student intern. The present study focuses on a diagnosis of the collaboration between mentors (university and school) in the development of the training activities and processes that take place during the school internships. These internships correspond to the teaching degrees and the master's degree in secondary education of the Faculty of Education Sciences of the University of Santiago de Compostela. Through a non-experimental study with descriptive methodology, using an online questionnaire, the perceptions of both profiles of mentors are collected. The first objective is to know the degree of collaboration that exists in the processes and in the different training activities that are currently carried out in the practicum; the second aim is to know the perception of the importance and necessity of such a collaboration in each of the proposed activities. The main results show the need to improve the collaboration and teamwork processes of the mentors and reinforce the relevance of designing and implementing specific technological solutions. It is necessary to connect both teaching profiles and educational contexts and to establish a hybrid training scenario that strengthens the training link between mentors and students in the practicum, allowing permanent and personalized support. This work is part of a Doctoral Thesis developed within the framework of the International Competitive research project EKT—Educational Knowledge Transfer-(Knowledge Alliance reference number 612414-EPP-1-2019-1-ES-EPPKA2-KA). The purpose is to develop and test collaborative educational methodologies for internships through an intelligent technological framework that aims to impact on a more effective, scalable, and sustainable system that is closely linked to professional contexts.

**Keywords:** initial teacher training; in-school placements; peer-to-peer teaching; teaching profession; e-learning



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## 1. Introduction

The present study is part of a Doctoral Thesis developed within the framework of the International Competitive Research Project EKT—Educational Knowledge Transfer-(reference number 612414-EPP-1-2019-1-ES-EPPKA2-KA) whose objective is to improve

European higher education and the development and experimentation of collaborative educational methodologies and an intelligent technological system that aims to improve teacher training and is closely linked to professional educational contexts. The project is contextualized in the Faculties of Education Sciences, and in the initial teacher training, through the teaching practices (also called the practicum), of the degrees of teacher training in early childhood and primary education and the master's degree in secondary education, which currently comprise up to 25% of the curricular training modules.

Different studies have shown the need to establish the internship period during the training of future teachers as a first pre-professional experience, providing the opportunity to "learn to teach" and to transfer theoretical knowledge into practice [1], to respond to the demands posed by the curriculum, an to learn and develop professionally, with these three areas playing a relevant role in the configuration of a quality practicum [2].The European Commission/EACEA/Eurydice [3] report highlights "real classroom experience" as one of the three key elements of initial teacher education, emphasizing the importance of "school placement" at the same level of "academic knowledge of their subject" and "pedagogical approaches". Jyrhämä [4] affirms that of the whole system that encompasses teacher education, the practicum is unquestionably the axis of initial teacher education, being the subject or educational process most valued by most students [5]. In the practicum, both theory and practice are combined in the clearest possible way, but there is a much more interesting phenomenon: students attend to the connection between the training world and the productive. Through this experience, students develop the knowledge and skills necessary for professional performance in real conditions and context [6]. According to González and Fuentes [7] the school internship period is considered a privileged space for the analysis of knowledge of and for teaching by reflecting on what teachers know and how they do it and how and who builds it, systematizing and disseminating knowledge from practice. The student cannot assume the mentoring of his/her practices as a simple reproduction of contents and methodologies by the mentor without attending to his/her individual development and reflecting on the teaching activity which will facilitate his/her insertion in the classroom [8,9]. Therefore, it is necessary for the student to build his/her own static and stable professional teaching identity during his/her internship, but accounting for the many versions of being a teacher, i.e., having to adapt to the different changing demands of the different educational contexts [10]. Therefore, the internship should be a necessary stage to promote reflective competence as a key element of teacher education. To this end, it is essential that both the university supervisor (also called university mentor) and the school mentor (also called school mentors) have certain characteristics that guarantee the success of their mentoring [11]. However, these key processes for promoting reflective learning in the teaching profession, such as collaboration, interaction, monitoring, and advisory processes, are sometimes neglected. Proponents of this model of practicum supervision have encountered difficulties in its implementation. The most common ones have to do with the competency profile and the lack of preparation and time of both the university mentor and the educational centers and the student to carry out such exhaustive monitoring. Other difficulties have to do with the lack of connection between the university and the internship centers, so that the reflections from one and the other are not always coherent. This would lead to a third difficulty, the discrepancy between the roles of teachers as reflective practitioners or as technicians [12]. It is therefore necessary to promote a specific space, as Zeichner [13] calls it, a third space, for the meeting of both mentors and student in a less hierarchical way, generating reflections in and on the practice of the training of future teachers. The practicum, co-participated by all the agents involved, should be of a strategic nature in the training of future teachers, creating a favorable scenario to promote the interaction between theory and practice, to exercise professional competences and to experiment with educational innovation proposals supervised by experienced professionals and analyzed by educational researchers. Despite being a strategic scenario for the training of future teachers, the training experience can be improved, and this improvement can be implemented through the application of technology-supported models such as, for

example, resources and services through e-learning. These new models aim to develop learning methodologies and solutions through smart devices [14]. However, first, it is necessary to carry out a study on the current organization and planning of the practicum in both university centers and internship centers, considering the agents involved in the development of the practicum as mentors (university and educational centers) of the practicum. There is a need for close communication and collaboration between them, as well as mutual knowledge of their functions and actions. This requires a training system that employs multiple resources and platforms and builds a new role for the supervisor with work dynamics that improve communication, between and intra, monitoring and evaluation of the student [15].

The present study aims to carry out an analysis on the state of collaboration between mentors (university and center) in the implementation of procedures and training activities related to the design and development of the practicum. For this purpose, we analyze, on the one hand, the perceptions of the agents involved (mentors) on the current level of collaboration between mentors and, on the other hand, their views on the importance of and need for both roles to collaborate in the different phases and training activities that take place during the teaching practicum. This analysis is one of the pillars on which the design of the initial version of the intelligent technological system for the practicum of the EKT project was based, which allows us to connect both educational contexts and both teaching profiles and which is being piloted in five European universities and countries that are part of the consortium (Spain, Ireland, Portugal, England, and Austria).

## 2. Materials and Methods

The research opted for the use of an interpretative approach using the type of descriptive study framed within the models of observational cross-sectional research. The design carried out corresponds to a non-experimental study of quantitative methodology using the questionnaire tool whose purpose is to obtain data that, after subsequent analysis, allow the research objectives and questions to be answered.

### 2.1. Participants

The group of interest corresponds to teachers who have participated in the mentoring of students in the practicum subjects of the bachelor's degree in Early Childhood Education Teaching, the bachelor's degree in Primary Education Teaching, and the master's degree in Teaching Compulsory Secondary Education and Baccalaureate, Vocational Training, and Language Teaching in the Faculty of Education Sciences of the University of Santiago de Compostela.

For this purpose, a purposive sampling of those teachers (N = 202) who have mentored (university and center mentors) internships during the academic years 2019/20 and 2020/21 was carried out, most of them being women, with 65.8% (N = 133) as was expected considering the feminization in teaching studies and in the teaching profession. The profile of the teaching staff in the sample corresponds to 22.3% university mentors (N = 45) and 77.7% center mentors (N = 157), a distribution consistent with the distribution of both profiles in the practicum since university mentors usually supervise multiple students simultaneously. Disaggregating the profile of center mentors, 32.2% corresponded to teachers (N = 65) of initial education (Early Childhood and Primary Education) and 45.5% to teachers of secondary education (Compulsory Secondary Education, Baccalaureate and Vocational Training). The average age of the participants (N = 202) was 49 years, ranging from 27 to 68 years, with an average teaching experience of 21.59 years, ranging from 2 to 42 years. Experience as an internship mentor (university and center) ranged from 0 to 34 years, with an average of 7.89 years.

### 2.2. Instrument

For the EKT research project, a questionnaire of 62 items (questions) divided into 5 sections and organized into 3 groups of 3 dimensions and 7 sub-dimensions was elabo-

rated. As mentioned above, this study focuses on the first subdimension whose purpose is to analyze the degree of collaboration between the university mentor and the center mentor regarding the most common procedures and activities that take place during the internship period. An instrument of 20 items on a Likert-type scale with 5 levels from 1 (not at all) to 5 (very much) was prepared, and applied to 2 questions with the purpose, on the one hand, of finding out the degree of collaboration between mentors (university and center) that currently exists in the practicum and, on the other hand, to find out the opinion on the need. The reliability of the scale was estimated with the aim of checking its internal consistency, obtaining a high reliability with alpha 0.973 for both the items relating to current collaboration and those relating to the need for collaboration. The Table 1 shows the Cronbach's alpha coefficient broken down for the 20 items with very little difference to the overall ($\alpha = 0.973$). Thus, we opted not to eliminate any item for correction.

**Table 1.** Statistical analysis of reliability Cronbach's alpha.

| Items | Activities/Procedures | Cronbach's Alpha If the Item Has Been Deleted | |
|---|---|---|---|
| | | Current Question | Question Need |
| 1 | Contacts, meetings, curricular coordination between the Faculty of Education and the educational center. | 0.972 | 0.973 |
| 2 | Selection of schools (profile, criteria...). | 0.972 | 0.973 |
| 3 | Selection of mentors from the university and the educational centers (profile, criteria...). | 0.971 | 0.972 |
| 4 | Establishment of norms, rules, procedures, forms/channels of communication for the development of the internship. | 0.971 | 0.971 |
| 5 | Elaboration of guidelines for the organization of the internship. | 0.971 | 0.972 |
| 6 | Elaboration of guidelines for the organization of the internship Final Report. | 0.972 | 0.972 |
| 7 | Orientation of the future teacher for recording and reporting on the internship experience. | 0.971 | 0.972 |
| 8 | Preparatory training of the future teacher for the internship. | 0.971 | 0.972 |
| 9 | Contextualization of the internship in the local community, the educational center, and the classroom/student group. | 0.971 | 0.972 |
| 10 | Development of instruments, tools, and criteria for student evaluation by future teachers. | 0.971 | 0.972 |
| 11 | Preparation, writing and presentation of educational materials, learning resources, monitoring instruments and reports. | 0.971 | 0.971 |
| 12 | Collaborative work between the university mentor and the school mentor. | 0.971 | 0.972 |
| 13 | Common process of supervision of teaching practices. | 0.971 | 0.972 |
| 14 | Direct classroom/practice observation. | 0.972 | 0.972 |
| 15 | Written or oral feedback to the future teacher. | 0.971 | 0.971 |
| 16 | Supervision of activities, tasks, and planning of teaching activities by the prospective teacher. | 0.972 | 0.971 |
| 17 | Supervision of the prospective teacher in his/her preparation of teaching support materials/resources. | 0.971 | 0.971 |
| 18 | Monitoring and analysis of the progress of future teachers. | 0.971 | 0.971 |
| 19 | Motivate future teachers for educational innovation. | 0.972 | 0.972 |
| 20 | Collaborative work between internship mentors (university and center) and future teachers. | 0.972 | 0.972 |

### *2.3. Procedure and Data Analysis*

Data collection was carried out by means of an online Microsoft Forms questionnaire, in compliance with the ethical data protection regulations of the University of Santiago de Compostela. The questionnaire was distributed in the two official languages of the autonomous community of Galicia (Galician and Spanish), with a response time of 3 months. The analysis was performed using IBM SPSS Statistics software (version 27), under the software license of the University of Santiago de Compostela, and Jamovi software (version 2.3.3.0) with free license. The data used are descriptive statistics of frequency

(mean, median, minimum, and maximum) and dispersion (standard deviation). Pearson's chi-square and Student's *t*-test parametric mean difference statistics for paired samples are also used. The significance level of 0.05 was used for all analyses.

## 3. Results

Table 2 shows the descriptive data on the degree of collaboration between mentors in the current state (overall mean of 3.02/5) and in what would be considered necessary (overall mean of 3.94/5) activities and procedures in the development of the practicum. It is observed that, in all of them, lower scores are obtained in the current state versus what is considered necessary. In the current state of collaboration, there is practically one point difference between the lowest mean, which is ($\bar{x}$ = 2.48), and the highest ($\bar{x}$ = 3.47). The lowest means, in the current state, correspond to the activities and/or procedures of contacts, meetings, curricular coordination between the faculty of education and the educational institution ($\bar{x}$ = 2.48), the selection of university and educational institution mentors ($\bar{x}$ = 2.55), collaborative work between university mentor and school mentor ($\bar{x}$ = 2.56), selection of schools ($\bar{x}$ = 2.57), common process of supervision of teaching practice ($\bar{x}$ = 2.74), and collaborative work between practice mentors (university and school) and prospective teachers ($\bar{x}$ = 2.88). The highest means in the current state correspond to the activities and/or procedures of motivating prospective teachers for educational innovation ($\bar{x}$ = 3.47), supervision of activities, tasks and planning of teaching activities by the prospective teacher ($\bar{x}$ = 3.40), written or oral feedback to the prospective teacher ($\bar{x}$ = 3.38), and supervision of the prospective teacher in his/her preparation of teaching support materials/resources ($\bar{x}$ = 3.30). The rest of the procedures and activities range between 3.00 and 3.25 points on average.

**Table 2.** Descriptive statistical analysis of the current and necessary degree of collaboration between mentors on activities and procedures in the development of the practicum.

| Items | Activities/Procedures | Collaboration | N | Mean | Median | SD | Min. | Max. |
|---|---|---|---|---|---|---|---|---|
| 1 | Contacts, meetings, curricular coordination between the Faculty of Education and the educational center. | Current | 202 | 2.48 | 2.00 | 1.21 | 1.00 | 5.00 |
| | | Required | 202 | 3.78 | 4.00 | 1.18 | 1.00 | 5.00 |
| 2 | Selection of schools (profile, criteria...). | Current | 202 | 2.57 | 3.00 | 1.31 | 1.00 | 5.00 |
| | | Required | 202 | 3.63 | 4.00 | 1.18 | 1.00 | 5.00 |
| 3 | Selection of mentors from the university and the educational centers (profile, criteria...). | Current | 202 | 2.55 | 3.00 | 1.31 | 1.00 | 5.00 |
| | | Required | 202 | 3.68 | 4.00 | 1.16 | 1.00 | 5.00 |
| 4 | Establishment of norms, rules, procedures, forms/channels of communication for the development of the internship. | Current | 202 | 3.08 | 3.00 | 1.23 | 1.00 | 5.00 |
| | | Required | 202 | 4.00 | 4.00 | 1.03 | 1.00 | 5.00 |
| 5 | Elaboration of guidelines for the organization of the internship. | Current | 202 | 3.10 | 3.00 | 1.32 | 1.00 | 5.00 |
| | | Required | 202 | 4.07 | 4.00 | 1.03 | 1.00 | 5.00 |
| 6 | Elaboration of guidelines for the organization of the internship Final Report. | Current | 202 | 3.08 | 3.00 | 1.30 | 1.00 | 5.00 |
| | | Required | 202 | 3.84 | 4.00 | 1.07 | 1.00 | 5.00 |
| 7 | Orientation of the future teacher for recording and reporting on the internship experience. | Current | 202 | 3.13 | 3.00 | 1.22 | 1.00 | 5.00 |
| | | Required | 202 | 3.97 | 4.00 | 1.00 | 1.00 | 5.00 |
| 8 | Preparatory training of the future teacher for the internship. | Current | 202 | 3.06 | 3.00 | 1.28 | 1.00 | 5.00 |
| | | Required | 202 | 3.97 | 4.00 | 1.02 | 1.00 | 5.00 |
| 9 | Contextualization of the internship in the local community, the educational center, and the classroom/student group. | Current | 202 | 3.22 | 3.00 | 1.29 | 1.00 | 5.00 |
| | | Required | 202 | 3.98 | 4.00 | 1.00 | 1.00 | 5.00 |

**Table 2.** *Cont.*

| Items | Activities/Procedures | Collaboration | N | Mean | Median | SD | Min. | Max. |
|---|---|---|---|---|---|---|---|---|
| 10 | Development of instruments, tools, and criteria for student evaluation by future teachers. | Current | 202 | 3.01 | 3.00 | 1.24 | 1.00 | 5.00 |
| | | Required | 202 | 3.93 | 4.00 | 1.07 | 1.00 | 5.00 |
| 11 | Preparation, writing and presentation of educational materials, learning resources, monitoring instruments and reports. | Current | 202 | 3.14 | 3.00 | 1.26 | 1.00 | 5.00 |
| | | Required | 202 | 3.92 | 4.00 | 1.03 | 1.00 | 5.00 |
| 12 | Collaborative work between the university mentor and the school mentor. | Current | 202 | 2.56 | 2.00 | 1.32 | 1.00 | 5.00 |
| | | Required | 202 | 3.94 | 4.00 | 1.10 | 1.00 | 5.00 |
| 13 | Common process of supervision of teaching practices. | Current | 202 | 2.74 | 3.00 | 1.32 | 1.00 | 5.00 |
| | | Required | 202 | 4.00 | 4.00 | 1.05 | 1.00 | 5.00 |
| 14 | Direct classroom/practice observation. | Current | 202 | 3.13 | 3.00 | 1.47 | 1.00 | 5.00 |
| | | Required | 202 | 3.94 | 4.00 | 1.13 | 1.00 | 5.00 |
| 15 | Written or oral feedback to the future teacher. | Current | 202 | 3.38 | 3.50 | 1.28 | 1.00 | 5.00 |
| | | Required | 202 | 4.01 | 4.00 | 1.04 | 1.00 | 5.00 |
| 16 | Supervision of activities, tasks, and planning of teaching activities by the prospective teacher. | Current | 202 | 3.40 | 4.00 | 1.29 | 1.00 | 5.00 |
| | | Required | 202 | 4.02 | 4.00 | 0.98 | 1.00 | 5.00 |
| 17 | Supervision of the prospective teacher in his/her preparation of teaching support materials/resources. | Current | 202 | 3.30 | 3.00 | 1.26 | 1.00 | 5.00 |
| | | Required | 202 | 4.01 | 4.00 | 0.99 | 1.00 | 5.00 |
| 18 | Monitoring and analysis of the progress of future teachers. | Current | 202 | 3.23 | 3.00 | 1.29 | 1.00 | 5.00 |
| | | Required | 202 | 4.00 | 4.00 | 1.01 | 1.00 | 5.00 |
| 19 | Motivate future teachers for educational innovation. | Current | 202 | 3.47 | 4.00 | 1.31 | 1.00 | 5.00 |
| | | Required | 202 | 4.16 | 4.00 | 1.00 | 1.00 | 5.00 |
| 20 | Collaborative work between internship mentors (university and center) and future teachers. | Current | 202 | 2.88 | 3.00 | 1.39 | 1.00 | 5.00 |
| | | Required | 202 | 4.08 | 4.00 | 1.05 | 1.00 | 5.00 |

In the need for collaboration, there is more than half a point difference between the lowest mean is ($\overline{x}$ = 3.63), and the highest ($\overline{x}$ = 4.16). The lowest means, in the need for collaboration, correspond to the activities and/or procedures for selection of educational centers ($\overline{x}$ = 3.63), selection of university and educational center mentors ($\overline{x}$ = 3.68), contacts, meetings, curricular coordination between the faculty of education and the educational center ($\overline{x}$ = 3.78), and elaboration of guidelines for the organization of the final internship report ($\overline{x}$ = 3.84). The highest means, in need, correspond to the activities and/or procedures of motivating future teachers for educational innovation ($\overline{x}$ = 4.16), collaborative work between internship mentors (university and center) and future teachers ($\overline{x}$ = 4.08), and elaboration of guidelines for the organization of the internship ($\overline{x}$ = 4.07).

The Table 3 shows the comparison of means on the collaboration of the procedures and/or activities in the current state and in the one that would be considered necessary among the mentors (N = 201). It is observed that, in all 20 items, there is a statistically significant difference ($p < 0.001$) corroborating that all procedures and activities are not currently developed as considered necessary.

Figure 1 shows that the activities and/or procedures that are most distant between what is currently carried out and what is considered necessary, and therefore most in demand, correspond to collaborative work between the university mentor and the school mentor (item 12) with 1.38 points difference; contacts, meetings, curricular coordination between the faculty of education and the educational center (item 1) with 1.30 points of difference; the common process of supervision of teaching practices (item 13) with 1.26 points of difference; collaborative work between practice mentors (item 20) with 1.20 points of difference; and the selection of university and educational center mentors (item 3) with 1.13 points of difference. Those activities and/or procedures less distant between what is currently performed and what is considered necessary and, therefore, less

demanded, correspond to the supervision of activities, tasks, and planning of teaching activities by the future teacher (item 16) with 0.62 points difference; written or oral feedback to the future teacher (item 15) with 0.63 points of difference; motivating future teachers for educational innovation (item 19) with 0.69 points of difference; and supervision of the future teacher in his/her preparation of teaching support materials/resources (item 17) with 0.71 points of difference.

**Table 3.** Student's *t*-test for paired samples for comparison of means on the current and necessary collaboration of activities and procedures in the development of the practicum.

| Items | Variables | | Statistics | gl | *p* | Difference in Averages | EE of the Difference |
|---|---|---|---|---|---|---|---|
| 1 | Current | Required | −12.49 | 201 | <0.001 | −1.297 | 0.1039 |
| 2 | Current | Required | −10.10 | 201 | <0.001 | −1.054 | 0.1044 |
| 3 | Current | Required | −11.10 | 201 | <0.001 | −1.134 | 0.1021 |
| 4 | Current | Required | −9.92 | 201 | <0.001 | −0.926 | 0.0934 |
| 5 | Current | Required | −9.68 | 201 | <0.001 | −0.970 | 0.1002 |
| 6 | Current | Required | −7.84 | 201 | <0.001 | −0.757 | 0.0966 |
| 7 | Current | Required | −8.91 | 201 | <0.001 | −0.837 | 0.0938 |
| 8 | Current | Required | −9.09 | 201 | <0.001 | −0.906 | 0.0997 |
| 9 | Current | Required | −7.68 | 201 | <0.001 | −0.762 | 0.0993 |
| 10 | Current | Required | −9.28 | 201 | <0.001 | −0.916 | 0.0987 |
| 11 | Current | Required | −8.04 | 201 | <0.001 | −0.777 | 0.0966 |
| 12 | Current | Required | −12.54 | 201 | <0.001 | −1.376 | 0.1098 |
| 13 | Current | Required | −11.70 | 201 | <0.001 | −1.257 | 0.1074 |
| 14 | Current | Required | −7.54 | 201 | <0.001 | −0.812 | 0.1077 |
| 15 | Current | Required | −6.33 | 201 | <0.001 | −0.634 | 0.1001 |
| 16 | Current | Required | −6.22 | 201 | <0.001 | −0.619 | 0.0995 |
| 17 | Current | Required | −7.34 | 201 | <0.001 | −0.713 | 0.0972 |
| 18 | Current | Required | −7.60 | 201 | <0.001 | −0.772 | 0.1016 |
| 19 | Current | Required | −6.99 | 201 | <0.001 | −0.693 | 0.0991 |
| 20 | Current | Required | −10.69 | 201 | <0.001 | −1.198 | 0.1121 |

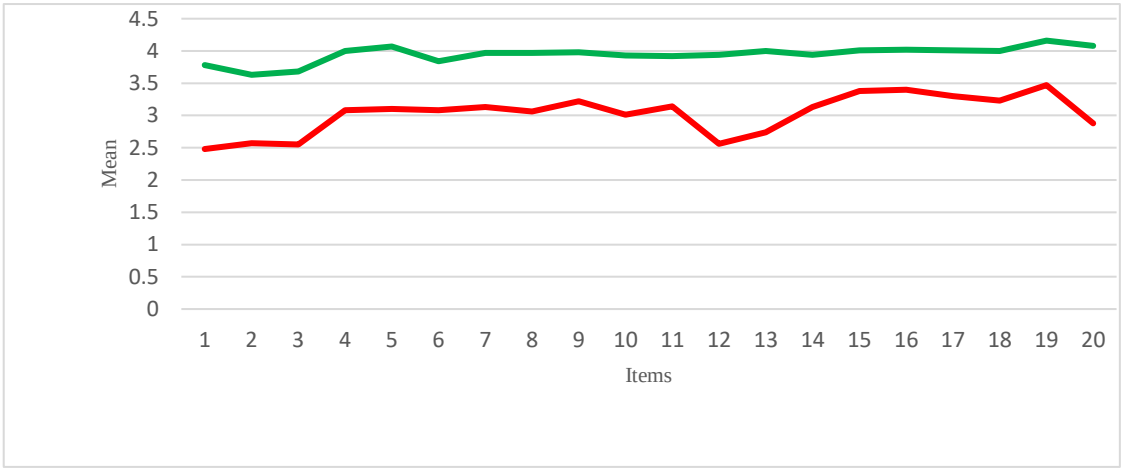


**Figure 1.** Graph of averages of the twenty activities/procedures on the degree of current and necessary collaboration. Note. Red line current and green line required.

The Table 4 shows the descriptive statistics and Pearson's Chi-square statistics on the degree of collaboration between mentors in the current and necessary activities and procedures in the development of the practicum, broken down by teaching profile. Considering the extreme scores obtained on the Likert scale from 1 to 5 on the degree of collaboration between mentors, the results of the 20 activities/procedures are shown below. Contacts, meetings, and curricular coordination between the faculty and the educational centers (item 1) are infrequent and the activity is considered necessarily important or very

important, with a higher value for university mentors, and with this difference being statistically significant (sig. 0.000). Mentors do not usually collaborate in the definition of the profile and assignment criteria in the educational centers (item 2) although both profiles consider it necessary. Mentors do not usually collaborate in the selection of teachers who will participate in the mentoring of the practicum (item 3). However, it is a procedure they consider necessary, with a greater appreciation on the part of university mentors and this difference being statistically significant (sig. 0.017). Mentors do not usually collaborate in the establishment of norms, rules, procedures, forms/channels of communication for the development of internships (item 4). On the other hand, both teaching profiles consider such collaboration to be necessary, this being the case to a greater extent for university mentors. The mentors also do not usually collaborate in the elaboration of guidelines for the organization of the internship (item 5), although they consider it very important, and this being appreciated to a greater extent by the university mentors. The mentors collaborate little or occasionally in the activity of elaborating guidelines for the organization of the final internship report (item 6), although both profiles consider it necessary. The mentors occasionally collaborate in the activity of orienting the future teacher to record reports on the internship experience (item 7). However, it is a procedure that is considered necessary by both teaching profiles. The mentors occasionally collaborate in the preparatory training activity of the future teacher for the internship (item 8). On the other hand, both teaching profiles consider this collaboration to be necessary, this being more so for university mentors. Similarly, mentors occasionally collaborate in the activity of contextualizing the internship in the local community, the educational center, and the students' classroom/group (item 9). However, it is a procedure that is considered necessary, and to a greater extent by the university mentors. The mentors occasionally collaborate in the development of instruments, tools, and criteria for the evaluation of students by future teachers (item 10), being a procedure considered necessary. Likewise, mentors occasionally collaborate in the preparation, writing, and presentation of educational material, learning resources, monitoring instruments, and reports (item 11), being a procedure they consider necessary. Collaborative work between the university mentor and the school mentor (item 12) is infrequent and the activity is considered necessarily important or very important, with a higher value for university mentors, this difference being statistically significant (sig. 0.000). Similarly, mentors do not usually collaborate in the common process of supervision of teaching practices (item 13). On the other hand, the activity is considered important or very important, with university mentors giving it a higher value, this difference being statistically significant (sig. 0.002). Direct observation of classroom/practice in collaboration between the university mentor and the school mentor (item 14) is infrequent, being by teaching profiles even less frequent than in the case of university mentors, this difference being statistically significant (sig. 0.000). However, it is considered an important or very important activity, with center mentors giving it a higher value, this difference being statistically significant (sig. 0.010). Written or oral feedback to the future teacher in collaboration between the university mentor and the school mentor (item 15) is infrequent, being a procedure considered necessary by university mentors, who give it a higher value. The supervision of activities, tasks, and planning of teaching activities by the future teacher in collaboration between the university mentor and the school mentor (item 16) is frequent, being valued to a greater extent by the school mentors, with a statistically significant difference (sig. 0.003). On the other hand, it is considered an important and very important activity, being in this case the university mentors who value it to a greater extent. Supervision of the prospective teacher in his/her preparation of teaching support materials/resources (item 17) is occasionally frequent. On the other hand, it is considered an important and very important activity, with the university mentors giving it the highest value. The monitoring and analysis of the process of future teachers (item 18) is occasionally frequent and is considered a necessarily important or very important activity, with a higher value by university mentors, this difference being statistically significant (sig. 0.007). Mentors usually collaborate in motivating future teachers

for educational innovation (item 19). In any case, both profiles consider it very important, with university mentors being the ones who give it more importance with a statistically significant difference (sig. 0.044). Mentors do not usually carry out collaborative work among themselves with future teachers (item 20). However, it is considered that it would be important and very important to do so, university mentors being those who value it more highly than center mentors, with a statistically significant difference (sig. 0.004).

**Table 4.** Descriptive statistics and Chi-square statistics on the degree of collaboration between mentors on current and necessary activities and procedures in the development of the practicum by teaching profile.

| Item | Colab. | Mentor | N | % of Frequencies and Average | | | | | | Chi-Square | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | $\bar{x}$ | Value | gl | Sig. |
| **1** | **Current** | **Univ.** | 45 | 17.8 | 31.1 | 31.1 | 6.7 | 13.3 | 2.67 | 22.478 | 4 | 0.000 |
| | | Center | 157 | 27.4 | 29.3 | 21.7 | 16.6 | 5.1 | 2.43 | | | |
| | Required | Univ. | 45 | 4.4 | 4.4 | 2.2 | 28.9 | 60.0 | 4.36 | | | |
| | | Center | 157 | 7.0 | 8.9 | 26.8 | 30.6 | 26.8 | 3.61 | | | |
| 2 | Current | Univ. | 45 | 37.8 | 17.8 | 22.2 | 17.8 | 4.4 | 2.33 | | | |
| | | Center | 157 | 26.8 | 19.7 | 26.1 | 17.2 | 10.2 | 2.64 | | | |
| | Required | Univ. | 45 | 8.9 | 6.7 | 20.0 | 28.9 | 35.6 | 3.76 | | | |
| | | Center | 157 | 5.1 | 12.7 | 27.4 | 27.4 | 27.4 | 3.59 | | | |
| 3 | Current | Univ. | 45 | 35.6 | 24.4 | 22.2 | 8.9 | 8.9 | 2.31 | 12.085 | 4 | 0.017 |
| | | Center | 157 | 27.4 | 19.1 | 28.0 | 15.3 | 10.2 | 2.62 | | | |
| | Required | Univ. | 45 | 2.2 | 6.7 | 24.4 | 15.6 | 51.1 | 4.07 | | | |
| | | Center | 157 | 5.1 | 13.4 | 26.1 | 29.9 | 25.5 | 3.57 | | | |
| 4 | Current | Univ. | 45 | 8.9 | 17.8 | 33.3 | 26.7 | 13.3 | 3.18 | | | |
| | | Center | 157 | 14.0 | 19.1 | 29.3 | 22.9 | 14.6 | 3.05 | | | |
| | Required | Univ. | 45 | 2.2 | 2.2 | 8.9 | 35.6 | 51.1 | 4.31 | | | |
| | | Center | 157 | 4.5 | 3.2 | 23.6 | 33.8 | 35.0 | 3.92 | | | |
| 5 | Current | Univ. | 45 | 13.3 | 15.6 | 28.9 | 26.7 | 15.6 | 3.16 | | | |
| | | Center | 157 | 14.0 | 24.2 | 19.7 | 23.6 | 18.5 | 3.08 | | | |
| | Required | Univ. | 45 | 2.2 | 0.0 | 17.8 | 28.9 | 51.1 | 4.27 | | | |
| | | Center | 157 | 3.8 | 5.1 | 17.8 | 32.5 | 40.8 | 4.01 | | | |
| 6 | Current | Univ. | 45 | 20.0 | 11.1 | 22.2 | 26.7 | 20.0 | 3.16 | | | |
| | | Center | 157 | 14.0 | 20.4 | 24.8 | 26.8 | 14.0 | 3.06 | | | |
| | Required | Univ. | 45 | 4.4 | 4.4 | 28.9 | 26.7 | 35.6 | 3.84 | | | |
| | | Center | 157 | 3.8 | 5.7 | 25.5 | 32.5 | 32.5 | 3.84 | | | |
| 7 | Current | Univ. | 45 | 13.3 | 8.9 | 28.9 | 35.6 | 13.3 | 3.27 | | | |
| | | Center | 157 | 14.0 | 15.9 | 29.3 | 28.0 | 12.7 | 3.10 | | | |
| | Required | Univ. | 45 | 2.2 | 11.1 | 15.6 | 26.7 | 44.4 | 4.00 | | | |
| | | Center | 157 | 2.5 | 3.8 | 21.7 | 38.9 | 33.1 | 3.96 | | | |
| 8 | Current | Univ. | 45 | 15.6 | 11.1 | 31.1 | 28.9 | 13.3 | 3.13 | | | |
| | | Center | 157 | 15.9 | 17.8 | 26.8 | 24.8 | 14.6 | 3.04 | | | |
| | Required | Univ. | 45 | 2.2 | 4.4 | 15.6 | 31.1 | 46.7 | 4.16 | | | |
| | | Center | 157 | 3.2 | 5.7 | 20.4 | 37.6 | 33.1 | 3.92 | | | |
| 9 | Current | Univ. | 45 | 13.3 | 15.6 | 35.6 | 17.8 | 17.8 | 3.11 | | | |
| | | Center | 157 | 13.4 | 14.6 | 24.8 | 28.0 | 19.1 | 3.25 | | | |
| | Required | Univ. | 45 | 2.2 | 4.4 | 6.7 | 42.2 | 44.4 | 4.22 | | | |
| | | Center | 157 | 3.8 | 5.1 | 17.8 | 42.7 | 30.6 | 3.91 | | | |
| 10 | Current | Univ. | 45 | 17.8 | 20.0 | 33.3 | 20.0 | 8.9 | 2.82 | | | |
| | | Center | 157 | 15.3 | 16.6 | 26.1 | 29.9 | 12.1 | 3.07 | | | |
| | Required | Univ. | 45 | 2.2 | 11.1 | 17.8 | 22.2 | 46.7 | 4.00 | | | |
| | | Center | 157 | 3.8 | 5.7 | 19.7 | 36.9 | 33.8 | 3.91 | | | |
| 12 | Current | Univ. | 45 | 24.4 | 31.1 | 20.0 | 13.3 | 11.1 | 2.56 | 22.192 | 4 | 0.000 |
| | | Center | 157 | 28.7 | 22.9 | 22.3 | 15.9 | 10.2 | 2.56 | | | |
| | Required | Univ. | 45 | 6.7 | 2.2 | 11.1 | 13.3 | 66.7 | 4.31 | | | |
| | | Center | 157 | 4.5 | 5.7 | 22.3 | 37.6 | 29.9 | 3.83 | | | |

**Table 4.** *Cont.*

| Item | Colab. | Mentor | N | % of Frequencies and Average | | | | | | Chi-Square | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | $\bar{x}$ | Value | gl | Sig. |
| 13 | Current | Univ. | 45 | 26.7 | 26.7 | 13.3 | 20.0 | 13.3 | 2.67 | | | |
| | | Center | 157 | 20.4 | 25.5 | 23.6 | 19.1 | 11.5 | 2.76 | | | |
| | Required | Univ. | 45 | 6.7 | 4.4 | 6.7 | 20.0 | 62.2 | 4.27 | 17.306 | 4 | 0.002 |
| | | Center | 157 | 3.2 | 4.5 | 21.7 | 38.9 | 31.8 | 3.92 | | | |
| 14 | Current | Univ. | 45 | 40.0 | 28.9 | 8.9 | 8.9 | 13.3 | 2.27 | 30.445 | 4 | 0.000 |
| | | Center | 157 | 15.9 | 8.9 | 25.5 | 21.0 | 28.7 | 3.38 | | | |
| | Required | Univ. | 45 | 8.9 | 8.9 | 22.2 | 8.9 | 51.1 | 3.84 | 13.295 | 4 | 0.010 |
| | | Center | 157 | 3.8 | 5.7 | 17.2 | 36.3 | 36.9 | 3.97 | | | |
| 15 | Current | Univ. | 45 | 11.1 | 22.2 | 26.7 | 24.4 | 15.6 | 3.11 | | | |
| | | Center | 157 | 11.5 | 10.2 | 25.5 | 27.4 | 25.5 | 3.45 | | | |
| | Required | Univ. | 45 | 2.2 | 2.2 | 20.0 | 22.2 | 53.3 | 4.22 | | | |
| | | Center | 157 | 3.2 | 5.7 | 21.0 | 33.1 | 36.9 | 3.95 | | | |
| 16 | Current | Univ. | 45 | 13.3 | 26.7 | 20.0 | 17.8 | 22.2 | 3.09 | 16.148 | 4 | 0.003 |
| | | Center | 157 | 11.5 | 6.4 | 28.0 | 29.9 | 24.2 | 3.49 | | | |
| | Required | Univ. | 45 | 2.2 | 4.4 | 11.1 | 40.0 | 42.2 | 4.16 | | | |
| | | Center | 157 | 3.2 | 5.1 | 15.3 | 43.3 | 33.1 | 3.98 | | | |
| 17 | Current | Univ. | 45 | 8.9 | 24.4 | 24.4 | 20.0 | 22.2 | 3.22 | | | |
| | | Center | 157 | 12.1 | 12.1 | 26.8 | 29.9 | 19.1 | 3.32 | | | |
| | Required | Univ. | 45 | 2.2 | 4.4 | 6.7 | 35.6 | 51.1 | 4.29 | | | |
| | | Center | 157 | 2.5 | 7.0 | 17.2 | 41.4 | 31.8 | 3.93 | | | |
| 18 | Current | Univ. | 45 | 15.6 | 17.8 | 22.2 | 17.8 | 26.7 | 3.22 | | | |
| | | Center | 157 | 12.7 | 14.0 | 27.4 | 28.7 | 17.2 | 3.24 | | | |
| | Required | Univ. | 45 | 2.2 | 8.9 | 8.9 | 22.2 | 57.8 | 4.24 | 14.086 | 4 | 0.007 |
| | | Center | 157 | 3.2 | 3.8 | 21.0 | 40.1 | 31.8 | 3.94 | | | |
| 19 | Current | Univ. | 45 | 11.1 | 15.6 | 20.0 | 24.4 | 28.9 | 3.44 | | | |
| | | Center | 157 | 10.8 | 12.1 | 22.3 | 28.0 | 26.8 | 3.48 | | | |
| | Required | Univ. | 45 | 0.0 | 8.9 | 6.7 | 20.0 | 64.4 | 4.40 | 9.809 | 4 | 0.044 |
| | | Center | 157 | 2.5 | 4.5 | 17.8 | 31.2 | 43.9 | 4.10 | | | |
| 20 | Current | Univ. | 45 | 22.2 | 28.9 | 17.8 | 11.1 | 20.0 | 2.78 | | | |
| | | Center | 157 | 22.3 | 17.2 | 22.3 | 23.6 | 14.6 | 2.91 | | | |
| | Required | Univ. | 45 | 2.2 | 6.7 | 11.1 | 11.1 | 68.9 | 4.38 | 15.354 | 4 | 0.004 |
| | | Center | | | | | | | | | | |

It should be noted that, disaggregating the teaching profile of the center mentors according to the educational level where they mentor the internships, statistically significant differences can be seen in their responses (Table 5) on the degree of collaboration in some activities and/or procedures between center mentors in early childhood education and primary education (E.I.) and center mentors in secondary education, high school, and vocational training (E.M.). The contacts, meetings, and curricular coordination between the faculty and the educational centers (item 1) are less frequent on the part of the mentors of initial education with respect to the mentors of intermediate education, this difference being statistically significant (sig. 0.042). The middle school mentors necessarily consider the collaboration of elaborating guidelines for the organization of the internship (item 5) to be very important compared to the mentors of the first years, who consider it to a lesser extent, this difference being statistically significant (sig. 0.033). Similarly, middle school mentors necessarily consider very important the collaboration on the preparatory training of the future teacher for the internship (item 8) as opposed to the mentors of initial teaching who consider it to a lesser extent, this difference being statistically significant (sig. 0.039). Finally, in the same line, middle school mentors necessarily consider the collaboration on the collaborative work between them and the future teachers (item 20) to be very important, as opposed to the mentors of initial teachings who consider them to a lesser extent, this difference being statistically significant (sig. 0.045).

**Table 5.** Descriptive statistics and Chi-square statistics on the current and necessary degree of collaboration between mentors on activities and procedures in the development of the practicum by teaching profile of center mentors.

| Item | Colab. | Mentor | N | % of Frequencies and Average | | | | | | Chi-Square | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | $\bar{x}$ | Valor | gl | Sig. |
| **1** | **Current** | **E.I.** | 65 | 29.2 | 36.9 | 21.5 | 6.2 | 6.2 | 2.23 | 9.836 | 4 | 0.042 |
| | | E.M. | 92 | 26.1 | 23.9 | 21.7 | 23.9 | 4.3 | 2.57 | | | |
| | Required | E.I. | 65 | 9.2 | 12.3 | 30.8 | 18.5 | 29.2 | 3.46 | | | |
| | | E.M. | 92 | 5.4 | 6.5 | 23.9 | 39.1 | 25.0 | 3.72 | | | |
| 5 | Current | E.I. | 65 | 18.5 | 29.2 | 23.1 | 13.8 | 15.4 | 2.78 | | | |
| | | E.M. | 92 | 10.9 | 20.7 | 17.4 | 30.4 | 20.7 | 3.29 | | | |
| | Required | E.I. | 65 | 4.6 | 10.8 | 20.0 | 23.1 | 41.5 | 3.86 | 10.520 | 4 | 0.033 |
| | | E.M. | 92 | 3.3 | 1.1 | 16.3 | 39.1 | 40.2 | 4.12 | | | |
| 8 | Current | E.I. | 65 | 16.9 | 23.1 | 24.6 | 18.5 | 16.9 | 2.95 | | | |
| | | E.M. | 92 | 15.2 | 14.1 | 28.3 | 29.3 | 13.0 | 3.11 | | | |
| | Required | E.I. | 65 | 4.6 | 12.3 | 20.0 | 32.2 | 30.8 | 3.72 | 10.092 | 4 | 0.039 |
| | | E.M. | 92 | 2.2 | 1.1 | 20.7 | 41.3 | 34.8 | 4.05 | | | |
| 20 | Current | E.I. | 65 | 20.0 | 24.6 | 18.5 | 18.5 | 18.5 | 2.91 | | | |
| | | E.M. | 92 | 23.9 | 12.0 | 25.0 | 27.2 | 12.0 | 2.91 | | | |
| | Required | E.I. | 65 | 4.6 | 10.8 | 15.4 | 36.9 | 32.3 | 3.82 | 9.745 | 4 | 0.045 |

## 4. Discussion

The results obtained show that there are differences in the perceptions of the mentors (university and center) on how they consider that the collaboration between them should be in the activities and procedures described above and what is currently happening in the school internships. All of them corroborate the need for greater collaboration between mentors in the different training activities and processes that take place during the school internships. Grouping these activities and/or procedures analyzed by categories, it is observed that, currently, in those related to the organization and prior preparation of the practicum (items 1, 2, 3, 4, 5, and 8) and to the processes of feedback and joint work with the internship student (items 11, 12, 15, and 20), the degree of collaboration is infrequent. However, in those related to student monitoring and guidance (items 7, 9, 13, 14, 14, 16, 17, 18. and 19) and to evaluation processes (items 6 and 10), the degree of collaboration is somewhat higher. In general, the need to improve the collaboration between both mentors with respect to the current situation is evident, and this assessment is shared by the members of the study. To this end, as indicated above, it is pertinent to design and develop a technological system that promotes and allows close communication, collaboration, and mutual knowledge between the agents involved in the mentoring of internships. In this sense, since the beginning of the 21st century, it has been pointed out [16] that it is a priority to establish coordination structures that allow the work and the relationship, not only among mentors, but also with the internship student himself/herself. To this end, it is necessary to find a meeting point between the school and university contexts to establish a strong collaboration and coordination between the two [17] by developing joint discourses on the practice of teacher training and the task of facilitating the development of future teachers [18]. However, in later studies [7], they continue to indicate that the student continues to develop traditional methodologies with a lack of collaboration between mentors. In more recent studies [19], the scarce direct collaboration of practicum mentors continues to be manifested even though it is a need demanded by both. On the other hand, it should be noted that there are also examples of successful experiences of meetings or training programs between mentors co-organized by both educational institutions and universities [20,21]. At this point, it is necessary to inquire about the reasons that generate this poor collaboration between mentors, which may be due, among other factors, to the lack of scenarios and/or tools that allow the connection of both professionals from their professional contexts, effective communication and coordination, the teaching profile of

mentors, the training for the development of this function, the time available to devote to this function, and the recognition of this crucial activity in teacher training in terms of the professional career.

One of the problems identified in this work refers to the fact that the profiles of mentors are different and belong to different institutions, which can generate divergent points of view on the very conception of the practicum, its organization, and development. It is also important to bear in mind the difference in the commitment and vision that both mentor profiles have with regard to the internship student. The university mentor owes a professional duty to the placement student, while the school mentor owes a priority duty to his/her own students at the educational center, taking on a voluntary collaboration in tutoring the placement student. [22]. Some studies [19–23] point out that although mentors show interest and an initial predisposition to participate in preparatory training activities organized by the faculties, the final collaboration in these activities is scarce. In the present study, it was found that the perception of university mentors on the need for collaboration is higher in practically all activities and/or procedures (18/20) than the perception of center mentors. There are also differences in the perception regarding some procedures, where middle school mentors consider that such collaboration is more necessary than mentors of early childhood and elementary education. These different visions confirm the need to create a structure of participation between the different profiles of mentors and students [24] in order to facilitate their working together both in the design of the process and in the training activities and processes that take place during the school internship. This will allow them to negotiate meanings, share objectives, and carry out an individualized monitoring of the internship student through a joint formative and continuous evaluation between mentors and student [25], analyzing the processes of autonomous learning and reflective thinking of the student from the different roles of their mentors as reflective and technical practical teachers [12].

Other variables that may explain the scarce collaboration among mentors may lie in the lack of time, geographical distance, the high number of simultaneous students, and the scarce or non-recognition of their work by the institutions. Zabalza [26] points out that the physical distance between educational centers and universities can be overcome with the use of ICTs, solving essential collaborative tasks in the development of the practicum of both mentors, as well as allowing horizontal communication of experiences among students. To this end, it is necessary to have a specific technological system for the practicum that is adapted to the characteristics and requirements of the practicum, with guidelines that regulate its use in accordance with data protection policies [27,28]. It is evident that the current tools available in universities (virtual campus) are not conceived as flexible spaces for collaboration and learning suitable for teaching practices, both in terms of their functionalities and tools, as well as the difficulty of extending them to external users such as center mentors. Therefore, to improve collaboration and communication between mentors and internship students, it is essential to design and develop a technological system adapted to the needs of the practicum and not as it has been done so far, where the needs of the practicum are adapted to the different existing resources and platforms. In this line, the EKT research project can give a priori an answer to these problems through the development of a system that makes it possible to connect both contexts and both professionals through a single comprehensive technological platform that allows collaboration and communication between all the agents involved in the planning and development of the practicum. The technological system must consider the processing of the learning analytics data of trainees, guaranteeing their privacy at all times. The specific tools must be oriented towards individualized monitoring and the promotion of learning processes based on observation and reflection. An example could be the design and use of the portfolio, where the trainees can have the capacity to decide to share it with their mentors and/or peers as their own space for reflection.

## 5. Conclusions

Collaboration between university mentors and schools continues to be a gap in the development of the practicum. The institutions involved in initial teacher training need to draw up a horizontal practicum training project that not only involves schools and school mentors in the development phase of the practicum, but also in the entire process, from the design of the training plan for the practicum training to the definition of the characteristics and instruments for its development and assessment. It is also necessary to define the reference characteristics to be taken into account in the selection of school and university mentors and work placement centers in order to guarantee levels of motivation, involvement, and professional profiles that are suitable for this task. With all this, and with the support of appropriate educational technologies that facilitate proximity, communication, and interaction in the process, the training of future teachers could undoubtedly take a qualitative leap forward.

Regarding limitations of the study, although the population sample is large, it would be important to replicate this study with teachers from other autonomous communities and to carry out qualitative studies that allow us to go deeper into the findings of this study.

Regarding lines of future research, based on the results obtained in the EKT project, we consider the possibility of making progress, once the technological system to support internships has been developed, in the exploitation of its learning analytics to improve formative assessment during internships.

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