

**EDUCATIONAL ECOLOGY BY EDGAR MORIN. MODEL TO SYSTEMATIZE THE  
PRE-PROFESSIONAL PRACTICE AND ITS ARTICULATION WITH THE  
RESEARCH SKILLS.**

**Margit Julia Guerra-Ayala**

Universidad Nacional de San Agustín, [mguerraa@unsa.edu.pe](mailto:mguerraa@unsa.edu.pe)  
<https://orcid.org/0000-0002-8128-1662>

**Santiago Sevilla-Vallejo**

Universidad de Salamanca, [santiago-sevilla@usal.es](mailto:santiago-sevilla@usal.es)  
Correspondence author <https://orcid.org/0000-0002-9017-4949>

**Yenny Rosario Acero Apaza**

Universidad Andina Néstor Cáceres Velásquez  
[d01324434@uancv.edu.pe](mailto:d01324434@uancv.edu.pe), <https://orcid.org/0000-0002-9783-7733>

**Emma Lourdes Durand Gómez**

Universidad Nacional de San Agustín, [edurandg@unsa.edu.pe](mailto:edurandg@unsa.edu.pe)  
<https://orcid.org/0000-0002-1896-9958>

**Abstract** -This article is based on the complex thinking defined by Edgar Morin and, specifically, on the ecology of education as a requirement for any work model that preserves the value of education. This takes the form of a study on the systematization of pre-professional practice and aims to present a methodological, theoretical model for its efficient execution consisting of four processes: Monitoring, reconstruction of experiences, feedback, and theorization; based on the proposal of Jara, the complex thinking of Morin, contributions from neuroscience and critical thinking. The study also aims to inform the systematization processes evaluation results, their level of efficiency, and their articulation with the research skills of 1,150 students from four universities and a Pedagogical Institute of Peru; and finally socialize the results of the application of the model in experimentation in 279 students from such population. The type of research was multimethodological by descriptive-correlative and experimental designs. The data collection for the first stage was through a virtual survey and for the second an evaluation rubric, whose results revealed the precarious level of both the systematization of the practice and the research skills of future professionals; the positive correlation between both variables and the significant impact of the application of the model in an experimental group. Therefore, the generation of spaces during pre-professional practice in universities is recommended to generate an excellent systematization to guarantee the development of research skills in students and prepare them to carry out their research work and generate more researchers.

**Index Terms** – Articulation of Areas, Pre-Professional Practice; Ecology of education, Research Skills; Systematization, Theoretical Methodological Model.

## INTRODUCTION

The pre-professional practice constitutes an essential element for the concretion of the competencies, capacities, or educational and professional objectives that the different curricular plans propose for various university careers primarily related to social sciences and humanities. Nevertheless, on many occasions, it has been attributed a total dependence on theory with subsequent presence to it, ignoring it as a source of knowledge and a space for developing skills to investigate and do science. Moreover, in this sense, the present work intends to show that an exclusive systematization model for pre-professional experiences could generate and enhance investigative skills in university or institutes students. The study was first based on a diagnosis of 1150 higher-level students belonging to various university careers: Education, Administration, Law, Psychology, and Sociology, revealing that between 76% and 77% did not have spaces to rebuild, provide feedback, or theorize their pre-professional practices. Along with their practice teachers, and although 51% of them were monitored, there was still a good portion left alone without accompaniment or supervision; In addition, such exploration showed that the students valued their research skills at an incipient level of development in 68% with only 12% distributed in the level of achievement of their research skills. Due to that, an experiment whose dependent variable was the development level skill to investigate with the stimulation of a Systematization model that considered the accompaniment as a monitoring or supervision mechanism, the reconstruction of the experiences of the pre-professional practice, the feedback, and theorizing. Such an experiment yielded significant differences through the non-parametric Wilcoxon test for the experimental group, legitimizing that the results obtained in the post-test were higher than the pre-test, concluding that the model produced changes in the group research skills. For this reason, this article presents the mechanisms and concepts used in the systematization of pre-professional practice and those potentialized research skills through the literature review section; the steps and way of carrying on the experiment through the methodology; the data are present in the results and the statistical significance of the hypothesis proof from the experiment which showed the difference between the tests. The discussion has some recent research about the central topic of this study and its results.

### **Systematization, its learning process, and learning conditions.**

Jara [1] presented the most elaborate and updated conception of systematization, which outlines it as a reflective reconstruction of living, historical, and complex social processes, in which the educational process is located, in that different actors intervene to identify the decisions made during the professional practices, occurring in a particular context and institution, in order to extract those learning that enriches the theory and improve the practice. The author recognizes a

closeness to research and evaluation, which present modalities very similar to the processes linked between systematization and practice, such as entering into the dynamics of experiences and circulating their different stages from their logic, locating its elements and relationships, identifying contradictions and establishing options for the construction of knowledge.

In this sense, Morin [2] perceives how today's society demands is a new way of dealing with knowledge. Edgar Morin claimed ecology as a form of complex thinking. In this sense, ecology is a way of preserving environments and one of them is the academic one. Therefore, this article presents the systematization of practice as a way to achieve educational ecology. As he points out, scientific knowledge is not natural but starts from a position that in many cases supposes the superiority of the human being over other species or the superiority of some human beings over others. Morin studies how different science models view human beings and their relationships, but they are no longer helpful because society directs towards a constant change [3]. Therefore, the new organization demands a complexity paradigm that contemplates the variety of identities within society and even the multiple identities that collide within the subject.

The systematization of educational practice would then constitute a kind of delimitation and specification of this assumed conception; the same which is very compatible with the arguments about the teaching practice of Schön [4], who describes that it is complex in itself and the development of the contents is not enough or only the knowledge that is provided in the development of the areas of the professions. Since the teaching profession requires an artistic and reflective practice where apart from applying the career techniques to interact and how to do something, it is necessary to recognize through thought what has contributed to results fostered in action. Therefore, a practice epistemology is necessary that identifies and develops from which Morin [5] also argued that every object of knowledge must be approached concerning its reality or context. Given that it is always with its environment.

The author had already provided principles: The dialogic, duality in unity; recursion, retroact of products; and hologrammatic, the whole is found in the parts and the parts in the whole; in order to study the reality that is not simple, there are many elements that it consists of, and that these elements are not isolated but interconnected. Moreover, Álvarez de Zayas [6] asserts that well effective teachers can perform more effectively through science and educate people and generations that respond to social needs according to their characteristics. This professional development is developer because it allows them to solve problems in their daily academic life with their human values, and instructive with knowledge and skills.

As professors, we want to provide enduring learning in our students. First, we must consider that different tasks incorporate Long-Term Memory in different grades. According to Cody Blair (cited in Casafont and Vilar,), [7] we retain 5% of the information. If we read, 10%. If we use audiovisual support, the proportion increases up to 20%. When we explain and argue, we favor consolidation up to 50%; if we do practical exercises, we get up to 75%, but if we get involved in constructing and communicating knowledge, we incorporate up to 90-95% of the assimilation of knowledge. It

has been shown that learning is more effective when four fundamental characteristics are present, which are: active engagement, group participation, frequent interaction, feedback, and connections with the natural world context (Roschelle et al., 2000, cited in Hernández).[8] Thus, active participation in the learning process and integration in a group are essential to foster significant knowledge. If the subject to learn has an emotional value for the learner, it will stimulate and regulate his or her psychological processes (Sevilla-Vallejo & Ceballos-Marón) [9] and, therefore, the learning process is solidified (Casafont & Vilar).[7]

Neuroeducation is a new perspective on teaching, based on neuroscience and based on "taking advantage of knowledge about how the brain works in an attempt to improve and enhance both the learning processes of students and teaching better in teachers" (Mora).[8] It points out that learning increases during a pleasant experience since it releases dopamine, one of the essential neurotransmitters in the brain, causing solid memories of the same, which leads to a cycle of anticipation of rewards before the next pleasant experience (Oliva).[9] Therefore, according to this author, if we want to take advantage of this effect of dopamine in our students, we must carry out activities based on pleasant learning. However, we should not confuse active methods with pure entertainment. When we refer to pleasantness, we mean that students experience their initiative and have challenges that they must address.

Critical thinking requires imagination and logical thinking by the student and the ability to associate content with life experience and background knowledge (Suárez-Monzón, Pérez-Cruz, Rodríguez-Hernández, & Sevilla-Vallejo). [10] For this reason, complex thinking offers the essential contents of holistic learning but a hermeneutic that deepens the construction of identity needed to complete it. In this sense, a systematic training model needs to offer discursive criteria. In this work, the complexity model of Morin will be connected to the critical narrative thinking of Ricoeur. Both models have three steps in the construction of knowledge. In Ricoeur's case, they are the following: mimesis I or prefiguration, which refers to one's own experiences; mimesis II or configuration I, in which the subject's discursive critical thinking interacts with other people or content; and mimesis III, by which the subject obtains a new vision of his reality. We must define an operational approach to identity at the educational level. For this, it must be considered that it is constantly constructed through discourse, implies "discursive identity" in the linguistic sense, and "identity in practice" refers to the actions in which the subject is involved to construct the discourse. (Kanno & Stuart). [11] Teachers must help students elaborate a complex perception about the world that surrounds them, and this means that teachers must develop strategies that foster initiative, reflection, and self-realization.

Morin's works have interdisciplinary applications. For example, Murga-Menoyo [12] observes that it offers criteria for the objectives of the Education 2030 agenda, which seeks full human development and recently applied to the development of active methodologies that incorporate pragmatism and critical hermeneutics (Jatem-Laguado et al.). [13] Finally, Díaz et al. [14] have analyzed the use of their model for the work of academic competencies. On the other hand,

Ricoeur's model is being studied to address critical thinking as one way to deal with others, with intersubjective senses of local and intercultural politics (Quero).[15] Therefore, the works of Morin and Ricoeur establish critical hermeneutics that complements each other to shape the critical thinking that defines the complete identity of the subject (Garcia & Sivini) [16] and they allow to work in an interdisciplinary way, as has been observed in the studies mentioned above.

We can synthesize the stages of critical thinking in a comparative way between both authors:

Morin	Ricoeur	Critical thinking
Dialogical principle	Mimesis I or prefiguration	Reflection on concrete ideas out of own experience
Discursive principle	Mimesis II or configuration	Reflection on more abstract ideas out of interaction
Hologrammatic principle	Mimesis III or refiguration	Reflection on complex personal view of reality

FIGURE 1

CORRESPONDENCE BETWEEN MORIN'S PRINCIPLES, RICOEUR'S MIMESIS.

Source: adapted from Sevilla-Vallejo and Oronoz (2021) [17]

As we have commented, critical thinking is essential for interdisciplinary approaches to knowledge. The knowledge dimension in systematization, especially that which is generated in practice, is strengthened both by the repetition and maturation of the students, as well as by the intervention of other disciplines that concomitantly give value to the entire set of theories, concepts, and notions that students are assimilating at each stage of their initial teacher training and constitutes a type of pedagogical knowledge Amórtegui & Mosquera. [18]

Although we live in times of uncertainty, the only thing sure is that ICTs and the mass media have become an almost essential resource for academic development, whatever the level, whatever the level, because they are channels that lead to emission-reception of message and knowledge itself (Reynosa Navarro et al.). [19] And in the case of the systematization model, it can be adapted to any virtual and face-to-face space.

**RESEARCH METHODOLOGY**

The study focused first on analyzing the procedures carried out after undergraduate students carry out their pre-professional practice and whether or not these processes consolidate such practice. From this to verify the relationship between their macro process of systematization and the

students' research skills through their perception towards it, and finally apply an effective model of systematization of pre-professional practice that develops investigative skills.

The hypotheses that directed the correlative study were whether there was a relationship between the level of systematization of pre-professional practice and the level of investigative skills; and the hypothesis of the experimental study was whether there were significant differences between the values of the pre-test and post-test applied to the group stimulated with the proposal, being the highest value of the post-test.

The type of research applied was Multimethodology with a descriptive-correlative level, an experimental cross-sectional design, and theoretical methods for the analysis of information, sources, and the modeling of the proposal (Guerra & Flores). [20] The population consisted of 1150 students from four universities and an Institute of Education in Peru. The sampling was probabilistic, and the sample was 279 students according to 95% reliability and 5% error. The technique was the survey for the first stage, which consisted in asking for the four aspects of the systematization according to our model: Monitoring/accompaniment/ supervision, Reconstruction of experiences, Feedback, and Theorizing with dichotomic answers; its validation was by Factor Analysis with KMO and Bartlett's Test and values of 0,799 and 0,000 significance level; its reliability by Measures of Sampling Adequacy (MSA) with correlations on average at 0.8.

**TABLE I**  
**ANTI-IMAGE CORRELATION MATRIX**

	Monitoring/ accompaniment / supervision	Reconstructio n of experiences	Feedbac k	Theorizin g
Monitoring/ accompaniment/supervisio n	,906 <sup>a</sup>	-,239	-,058	-,099
Reconstruction of experiences	-,239	,831 <sup>a</sup>	-,336	-,319
Feedback	-,058	-,336	,762 <sup>a</sup>	-,563
Theorizing	-,099	-,319	-,563	,766 <sup>a</sup>

Source: own calculations based on <sup>a</sup> Measures of Sampling Adequacy (MSA)

Source: own calculations based on a Measures of Sampling Adequacy (MSA)

Theoretical methods were the dialectical method to search and find the contradictory relationships between the object of study and the problem, the deductive method for the analysis of the problematic situation and establishment of the problem, the analysis of the theoretical framework, and selection of recommendations, the hypothetical deductive method allowed to establish the hypothesis of this research work; the historical method helped to know the different stages of the

object of study in their chronological succession, the evolution and development of the problem of systematization training. The historical-logical method made it possible to discover the internal relations of the training in systematization based on the study of its historical trajectory, thrown by the historical method, the inductive method, to establish the conclusions. Finally, the Modeling method was explicitly applied for the elaboration of the theoretical model, in which the different theories related and how they were going to work to propose the solution to the problem encountered.

The strength of this study is that it used various methods to address the issue, delve into its problem and consider a solution proposal that was applied and evaluated appropriately to validate it. The study would present a specific limitation in the generalization of the proposal since the systematization model of pre-professional practice would have to be made possible by specialists not only in the area but with didactic and pedagogical skills and an expert in research. Their gaze will always have to be to the development of such skills and to articulate the initial research process itself, such as scientific problematization, hypotheses, categorization, etc.

## RESULTS

Table I shows the results of the preliminary diagnostic survey of the 1150 students regarding compliance with the processes of systematization of pre-professional practice. Many students answered that their institutions do not realize those at all. However, monitoring is a process that is carried out partially in 51%, and the other processes are not fulfilled in 76% and 77%.

**TABLE II**  
**PRELIMINARY DIAGNOSIS TO THE SYSTEMATIZATION OF PRE-PROFESSIONAL PRACTICE**

	No		Yes	
	Count	Row N %	Count	Row N %
Monitoring/accompaniment/supervision	566	49%	584	51%
Reconstruction of experiences	873	76%	277	24%
Feedback	876	76%	274	24%
Theorizing	891	77%	259	23%

Figure 1 shows that research skills in students are primarily between undeveloped and in process, and only 12% consider that they are developed. These figures are a bit worrying because students are at the gates of carrying out their research work to obtain their academic degrees and do not have the skills developed for this purpose.

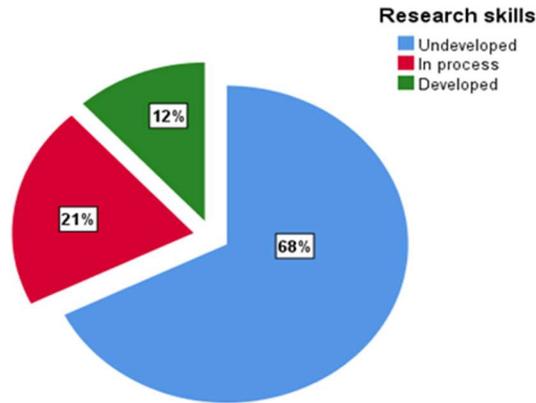


FIGURE 2  
DISTRIBUTION OF RESEARCH SKILLS DEVELOPMENT IN THE STUDENTS SURVEYED

Source: own calculations based on population percentage.

The study also considered analyzing the level of systematization of pre-professional practice in terms of efficiency, which is shown in figure 2 that only 16% of the students' practices were efficiently systematized. They were limited to only one of the four systematization processes, and contrasting with the information presented previously, we infer that this element was most likely monitoring. Furthermore, that is compatible with some documents analyzed in the university web portals that there are internship teachers whose role is to accompany, monitor, or supervise the execution of the pre-professional internships of the students.

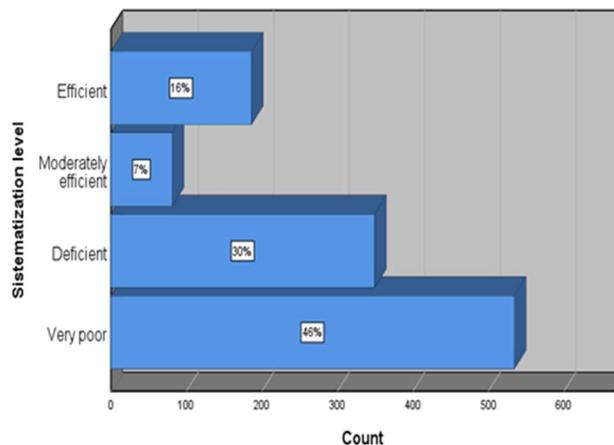


FIGURE 3  
DISTRIBUTION OF SYSTEMATIZATION LEVEL IN THE STUDENTS SURVEYED

Source: own calculations based on population percentage.

The previous findings and the hypotheses raised led to the correlation test between variables already delimited, reflecting a robust positive association between variables with a Rho of 0.673 and high significance with an alpha of 0.000. Therefore, the working hypothesis was accepted, and it interprets that the more efficient the systematization of the pre-professional practice, the more efficient the research skills in the students.

TABLE III  
 CORRELATION BETWEEN SYSTEMATIZATION LEVEL AND RESEARCH SKILLS

			Systematization level	Research skills
Spearman's rho	Systematization level	Correlation Coefficient	1,000	<b>,673**</b>
		Sig. (2-tailed)	.	<b>,000</b>
		N	1150	1150
	Research skills	Correlation Coefficient	<b>,673**</b>	1,000
		Sig. (2-tailed)	<b>,000</b>	.
		N	1150	1150

Note: \*\*. Correlation is significant at the 0.01 level (2-tailed).

Note: \*\*. Correlation is significant at the 0.01 level (2-tailed).

The results of the experiment applied with the Systematization model that presents all the processes showed significant differences between the values of the post-test and the pre-test. The charts show that the sum of ranges of the post-test was higher than that of the pre-test, expressing with this an improvement of the students' investigative skills from the application of the model.

TABLE IV  
 WILCOXON SIGNED RANKS TEST

		N	Mean Rank	Sum of Ranks
Post-test - Pre-test	Negative Ranks	1 <sup>a</sup>	9,00	9,00
	Positive Ranks	235 <sup>b</sup>	118,97	27957,00
	Ties	43 <sup>c</sup>		
	Total	279		

a. Post-test < Pre-test

b. Post-test > Pre-test

c. Post-test = Pre-test

**TABLE V**  
**TEST STATISTICS**

	Post-test - Pre-test
Z	-13,400 <sup>b</sup>
Asymp. Sig. (2-tailed)	,000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

## DISCUSSION

We consider the processes presented in the model as minimum criteria for a systematization of pre-professional practice. In this sense, at least all of them must be made viable, but according to the results, only medium priority is being given to supervised, monitored, or accompanied students. It is because it is a common practice that ranges from monitoring to practices in classes, online conferences, participation, and commitment of students; there are even exclusive models for such monitoring, such as Diamond (Mershad & Said) [21] aimed at university students in a distance education context or through platforms such as Zoom, Webex, Etc. It has been of more significant concern to generate accompaniment and support mechanisms for students in their academic practice, mainly in engineering; this is why more research is observed in such disciplines, generating productions that help students in their accompaniment and universities to monitor their students' perception of the usefulness of co-curricular support mechanisms (Lee et al.). [22] There are also specific studies on accompaniment, to which they make a slight differentiation with monitoring, where the first is based on horizontality and cultivates relationships of trust, camaraderie, and empathy with openness to exchanges of experiences. In contrast, the second is based on verticality since the headquarters or management use this tool to verify the activities carried out in the work of their subordinates (Loyola). [23]

On the other hand, supervision, another synonymous line of monitoring and accompaniment, marks a conceptual distance since it is an old term and little studied. However, some institutions still practice it and advise it to strengthen the teaching identity in students through the monitoring and tutoring of the practice by the most experienced teachers, as in the study by Andreucci-Annunziata & Morales Cabello [24] but who did not have a representative sample to demonstrate the impact of supervision as such. However, our study considered monitoring, accompanying, and supervision in the best sense. We saw a percentage close to the average that does carry out these activities in teaching practice. There has always been interested in this systematization dimension, not as a constituent component but close to pre-professional practice.

Commonly, the other components of the systematization are not present to a large extent in the students; this is because the developed standards during the professional performance as in the United Kingdom where doctoral students develop professional practice, such as clinical, with interprofessional support among peers who theorize their experiences as a result of their applied research, which is recorded and evaluated (Morley & Petty [25.] Therefore, theorizing is not

typical in pre-professional practice. Moreover, it is not usual because years ago, university or higher education was not synonymous with research until this last decade in which due importance has been given to the role of each teacher trainer and use research as transversality in the development of their areas during undergraduate and not until after the student graduates and wishes to study a postgraduate degree.

It is the same case for the reconstruction and registration of the professional practice experiences; it is not usual during the initial professional formation, nor in the career of Education or other Social Studies. Nevertheless, reviewing investigations, we found in a work of the area of health carried out by Chamblee et al. [26] that since 2005 in the United States, some institutions have implemented the use of clinical scale programs to recognize and progressively reward the effective practice of the nursing area in its practicing professionals through their recorded evidence as a result of their reconstructed experiences and compiled into portfolios, which are evaluated using a professional performance assessment tool: Performance Excellence and Accountability (PEAC) based on the advanced practice roles of practitioner, consultant, researcher, and educator.

Feedback is a process, and an evaluation tool for learning that has had strength in education and initial professional training in all careers. However, the results showed that it had not been carried out during the systematization process in pre-professional practice in the study population. We consider that it is a fundamental axis because it would guarantee better-rescheduled interventions resulting from the mediation of the supervising teacher and classmates. In this sense, the study carried out by Zhang & Zheng at a university in the United Kingdom [27] explored the usefulness of feedback in improving learning, finding that students require more feedback from their teachers, and this could have an immediate effect on their linguistic practices. Nevertheless, the feedback that we postulate in pre-professional practice is not only the role of teachers but also of peers, and this position aligns well with the work of Gong et al., [28] who analyze Chinese workers in their professional context, determining the importance of feedback from co-workers in improving job performance and correlated to monitoring.

Regarding the results of the positive confirmation between the level of systematization and the level of research skills, it is possible to contrast it with the large-scale study in Australian bachelor's graduates by Ain et al., [29] who demonstrated that the research skills of employed graduates such as critical thinking and problem solving developed or not during their university education had an impact on their professional praxis in their workplaces. Although they found contradictions between the perspectives between workers and students, the latter have a higher appreciation of their generic and research skills than their workers. Likewise, Willison et al. [30] argued for an impact of research skills and evidence-based practice on graduates' attitudes subsequently employed in Australian oral health clinics.

Finally, the experiment results have shown that as a systematization model of pre-professional practice is applied that contains the processes of monitoring, reconstruction of experiences, feedback, and theorization, the development of research skills from the pre-professional would be

guaranteed grade. Aligned to this, the study by Walkington et al. [31] justifies the incorporation of research and inquiry skills from the beginning of professional training in the undergraduate curriculum and that such skills are explicit for students. Similarly, Lexis & Julien [32] indicated that developing research projects with tangible and sustainable praxis for at least three years of the undergraduate course enhances students' research skills.

## CONCLUSIONS

The methodological, theoretical model to systematize the pre-professional practice proposed in the study comprises four processes: monitoring, reconstruction of experiences, feedback, and theorization; It is based on Morin's theory, inspired by Jara's proposal and the neurosciences.

The only systematization process that has been carried out regularly according to the 1,150 university students' response was monitoring with 51%. Other processes were limited to 24% in the reconstruction of experiences case and feedback and 23% in the case of theorizing.

The developed investigative skills of the surveyed student population are in 12%, and in the rest, they are still in process with 21% and 68% not developed. Therefore, it is concluded that inefficient investigative skills are in large part of the students.

The level of systematization of pre-professional practice is mainly in the lower stages of deficiency and very poor, housing a total of 76% of the university population surveyed.

This study demonstrated the relationship between the systematization of pre-professional practice and investigative skills, concluding that the better the level of systematization, the better developed the research skills in the students. Therefore, it is crucial to generate spaces during pre-professional practice in universities so that they are adequately systematized, thus guaranteeing that the research skills that all students require to carry out their future research are developed.

The systematization model of pre-professional practice that contemplates monitoring, reconstruction of experiences, feedback, and theorization had generated significant changes in student populations in favor of their research skills; Therefore, it is recommended its application and generalization through the curriculum during the initial professional training of those careers that consider the area of practice in their study plans.

## REFERENCES

- [1] Jara, O. (2018). La sistematización de experiencias: práctica y teoría para otros mundos posibles. Fundación Centro Internacional de Educación y Desarrollo Humano CINDE, Bogotá, Colombia.
- [2] Morin, E. (1995). Introducción al pensamiento complejo. Barcelona: Gedisa / Roque, M. Á. (n. d.). Hacia el pensamiento ecologizado. Retrieved from: <https://www.iemed.org/publication/hacia-el-pensamiento-ecologizado-entrevista-a-edgar-morin/?lang=es>

- [3] Sevilla-Vallejo, S. (2017). Sociología literaria de la modernidad. Estudio comparado de 1984 de George Orwell y La Fundación de Antonio Buero Vallejo. *Revista Cálamo FASPE*, 65, 72-79
- [4] Shön, D. (1997). La formación de profesionales reflexivos. Hacia un nuevo diseño de la enseñanza y el aprendizaje en las profesiones. Paidós
- [5] Morin, E. (2001). El método I La naturaleza de la Naturaleza, Madrid, Cátedra.
- [6] Álvarez, C. (s.f.) Didáctica de la educación superior. UNPRG-Facultad de Ciencias Histórico-Sociales y Educación. Lambayeque.
- [7] Casafont i Vilar, R. (2016). Bases neurocientíficas del aprendizaje. *Rizoma freireano*, 20.
- [8] Hernández Requena, S. (2008). El modelo constructivista con las nuevas tecnologías, aplicado en el proceso de aprendizaje. *RUSC. Universities and Knowledge Society Journal*, 5 2, 26-35.
- [8] Mora Teruel, F. (2013). Neuroeducación. Solo se puede enseñar aquello que se ama. Madrid: Alianza.
- [9] Sevilla-Vallejo, S. & Ceballos-Marón, N.A. (2020). Theoretical and Applied Study of the Psychological and Educational Effects of Lockdown in Primary School Students in Argentina. *Social Sciences & Humanities Open* 2, 1-6. <https://doi.org/10.1016/j.ssaho.2020.100039>
- [10] Suárez-Monzón, N., Pérez-Cruz, I. C., Rodríguez-Hernández, A., & Sevilla-Vallejo, S. (2020). Lectura crítica en el desarrollo de habilidades de investigación en profesores de postgrado. *Revista de ciencias sociales (Ve)*, 26(2), 328-339. <http://dx.doi.org/10.31876/rcs.v26i0.34131>
- [11] Kanno, Yatsuko, Stuart, Christian (2011). Learning to Become a Second Language Teacher: Identities-in-Practice. *Modern Language Journal*, 95(2), pp. 226-252.
- [12] Murga-Menoyo, M. A. (2021). Education in the Anthropocene. Between Possibilism versus Utopia. *Teoria de La Educacion*, 33(2), 107–128. <https://doi.org/10.14201/teri.25375>
- [13] Játem-Laguado, M. F., Senior-Naveda, A., & Marín-González, F. (2020). Between pragmatism and critical hermeneutics. A philosophical-methodological interface for the study of active pedagogy. *Utopia y Praxis Latinoamericana*, 25(90), 232–244. <https://doi.org/10.5281/zenodo.3928865>.
- [14] Díaz, G. A. T., Corrales, M. U., & Rincón, D. A. V. (2021). The theory of complexity and its contribution to the debate on the academic competences of the university engineer-teacher. *Revista de Filosofía (Venezuela)*, 38(97), 279–294. <https://doi.org/10.5281/zenodo.4877157>.
- [15] Quero, V. (2006). Formación docente, práctica pedagógica y saber pedagógico. *Laurus*, vol. 12, núm. Ext, 2006, pp. 88-103
- [16] Garcia, M & Sivini H (2020) Model of Educational Reconstruction as a Theoretical and Methodological contribution to the Design of Environments of Science Teaching and Learning. *Investigações em Ensino de Ciências*, V25 (1), pp. 262 – 281.
- [17] Sevilla-Vallejo, S. & Oronoz Rodríguez, S. (2021). El pensamiento complejo de Edgar Morin y la identidad narrativa de Paul Ricoeur. Criterios para la aplicación de estos modelos al trabajo en valores en textos literarios. Homenaje a Edgar Morin: una mente luminosa, mandálica y compleja (pp. 147-168). Huelva: Universidad de Huelva.

- [18] Amórtégui, E. y Mosquera, J. (2018). Aportaciones de la práctica pedagógica en la construcción del conocimiento del profesor. *Tecné, Episteme y Didaxis: TED*, 43, 47-65.
- [19] Reynosa Navarro, E., Guerra Ayala, M. J., Casimiro Urcos, W. H., Vélez-Jiménez, D., Casimiro-Urcos, N. C., Salazar Montoya, E. O., Casimiro-Urcos, J. F., & C. T. (2021). World Journal on Educational Technology: Current Issues Relevance of the mass media in Prevention, Education and Contextual Management of COVID-19. *World Journal on Educational Technology: Current Issues*, 13(1), 129–146. <https://doi.org/10.18844/wjet.v13i1.5423>
- [20] Guerra, M., & Flores, D. (2020). La competencia de investigación en algunas instituciones de pregrado medida a través del nivel de vicios metodológicos en los informes de investigación científica. In Dykinson (Ed.), *España: Investigación e innovación educativa frente a los retos para el desarrollo sostenible* (p.p.1005-1013) ISBN: 978-84-1122-022-4
- [21] Mershad, K., & Said, B. (2022). DIAMOND: A tool for monitoring the participation of students in online lectures. In *Education and Information Technologies*. <https://doi.org/10.1007/s10639-021-10801-y>
- [22] Lee, W. C., Hall, J. L., Godwin, A., Knight, D. B., & Verdín, D. (2022). Operationalizing and monitoring student support in undergraduate engineering education. In *Journal of Engineering Education* (Vol. 111, Issue 1, pp. 82–110). <https://doi.org/10.1002/jee.20431>
- [23] Loyola, M. (2019). “Influencia del monitoreo y acompañamiento pedagógico en el desempeño docente en instituciones educativas de nivel inicial, años 2016, 2017, 2018.” 79. [http://dspace.unitru.edu.pe/bitstream/handle/UNITRU/14467/Loyola Marquezado Milagrito Carolina.pdf?sequence=1&isAllowed=y](http://dspace.unitru.edu.pe/bitstream/handle/UNITRU/14467/Loyola_Marquezado_Milagrito_Carolina.pdf?sequence=1&isAllowed=y)
- [24] Andreucci-Annunziata, P., & Morales Cabello, C. (2020). Hacia la construcción de la identidad docente inicial: una aproximación intersubjetiva y dialógica desde la supervisión pedagógica en el prácticum. In *Profesorado, Revista de Currículum y Formación del Profesorado* (Vol. 24, Issue 3, pp. 441–463). <https://doi.org/10.30827/profesorado.v24i3.14089>
- [25] Morley M., & Petty, N. (2010). Professional doctorate: combining professional practice with scholarly inquiry. *British Journal of Occupational Therapy*. 2010;73(4):186-88. <http://doi.org/b3jzt9>
- [26] Chamblee, T. B., Dale, J. C., Drews, B., Spahis, J., & Hardin, T. (2015). Implementation of a Professional Portfolio: A Tool to Demonstrate Professional Development for Advanced Practice. *Journal of Pediatric Health Care*, 29(1), 113–117. <https://doi.org/10.1016/j.pedhc.2014.06.003>
- [27] Zhang, L., & Zheng, Y. (2018). Feedback as an assessment for learning tool: How useful can it be? *Assessment and Evaluation in Higher Education*, 43(7), 1120–1132. <https://doi.org/10.1080/02602938.2018.1434481>
- [28] Gong, Z., Liu, M., Xin, D., Gilal, F. G., Yin, K., & Zhang, N. (2020). Coworker feedback seeking and feedback environment in China: An expectation states theory approach. *Social Behavior and Personality*, 47(9). <https://doi.org/10.2224/SBP.8392>

- [29] Ain, C. T., Sabir, F., & Willison, J. (2019). Research skills that men and women developed at university and then used in workplaces. *Studies in Higher Education*, 44(12), 2346–2358. <https://doi.org/10.1080/03075079.2018.1496412>
- [30] Willison, J., Zhu, X., Xie, B., Yu, X., Chen, J., Zhang, D., Shashoug, I., & Sabir, F. (2020). Graduates' affective transfer of research skills and evidence based practice from university to employment in clinics. *BMC Medical Education*, 20(1), 1–18. <https://doi.org/10.1186/s12909-020-1988-x>
- [31] Walkington, H., Griffin, A. L., Keys-Mathews, L., Metoyer, S. K., Miller, W. E., Baker, R., & France, D. (2011). Embedding research-based learning early in the undergraduate geography curriculum. *Journal of Geography in Higher Education*, 35(3), 315–330. <https://doi.org/10.1080/03098265.2011.563377>
- [32] Lexis, L. A., & Julien, B. L. (2014). A model of investigative project work to teach discipline-specific research skills to students studying advanced human physiology. *International Journal of Innovation in Science and Mathematics Education*, 22(4), 15–32.