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Knowledge management and its influence on academic performance at higher level, Peru

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Abstract---Knowledge management, learning methods, academic performance. In times of the second pandemic outbreak, the influence of the use of knowledge management on academic performance in students of the mining exploitation study program of the Erasmo Arellano Guillén Institute of Public Technological Higher Education,

Pataz, La Libertad, Peru, was determined. The study corresponds to a non-experimental, causal correlational descriptive design. A population of 141 students and a sample of 59 were reported, chosen by non-probabilistic sample selection. The information collection instrument was the survey to determine the levels of knowledge management in students by (Velásquez, 2018), which evaluates the dimensions: Organizational culture, internal communication, development of skills and planning. For the association, the Rho Spearman coefficient was used and for the linear regression effect, registering: knowledge management and its dimensions, significantly influence ($p < 0.01$) academic performance ($r = 0.920$; $r^2 = 84.7\%$ $r = 0.897$, $r^2 = 80.4\%$, $r = 0.894$, $r^2 = 80.0\%$, $r = 0.770$, $r^2 = 59.3\%$). In conclusion, knowledge management and its elements should be stimulated to increase the academic performance of mining students.

Keywords---knowledge management, social media, learning methods, teacher effectiveness, student evaluation, teaching methods, pandemics.

Introduction

According to Nonaka and Takeuchi (1999), knowledge management is the ability and competence that organizations have to create new knowledge, disseminate it among the subjects of the institution and materialize them in services and goods, this implies that companies and / or institutions must be spaces where people have the ability to create and transfer knowledge. Currently, universities are subject to processes of changes and transformations in the face of the challenges posed by the so-called knowledge society, which gives them a central social role in the production, preservation and transfer of knowledge (Esquivel et al., 2017). On the other hand, Rodríguez et al, (2001), affirms in the conceptual dimension, that the teacher needs to be willing to teach updated concepts to the student and facilitate the construction of his own knowledge.

In Colombia, the effect of knowledge management on academic performance at the higher level was evaluated , whose results show the impact that favors the development of standards for their respective accreditation (González-campo et al., 2021). In the same vein (Bervell & Arkorful, 2020), they affirm that the learning management system favors distance education, in the same way (Suryaman et al., 2020), endorses that the integration of knowledge management allows the acquisition of virtual resources; likewise, (Barbón Pérez & Fernández Pino, 2018), they consider that knowledge management favors the technological innovation in problem solving; in that sense, by systematizing information, it allows obtaining online curricula and solutions to academic problems (Correa-Díaz et al., 2019). These evidences support the continuous improvement in virtual education through innovation and creativity in times of the second health outbreak (Muñoz-Sánchez et al., 2021).

With a sample of 30,383 students from 62 countries, the study revealed that, amid the global lockdown, some students showed deficiencies in computer skills

with decreased academic performance in the new virtual environment (Aristovnik et al., 2020); in that sense respondents with online training improved their academic performance through knowledge management (Tus et al., 2020); In addition, different e-learning modes were implemented using different platforms to achieve the objectives (Wang and Zhao, 2020). Affirming that teachers and students in virtual environments had favorable experiences in teaching-learning (Rasiah et al., 2020).

Likewise, Miguéis et al. (2018) carried out the exploration of data for the classification of students according to their competences, in order to improve their academic performance, obtaining more learning resources and achieving a level of effectiveness of 95%. These data are supported by, (De La Hoz et al., 2019) who proposed to implement virtual environments, to favor achievements in the flipped classroom with an efficiency of 91%. Likewise, Taylan & Karagözoğlu, (2009) argue that through knowledge management it carried out a process based on artificial intelligence to predict the academic performance of students.

Currently, the learning transfer process is part of systematizing information, using the LMS and social networks, strengthening the academic performance of students (Hermann-Acosta & Pérez Garcías, 2019), considering collective learning as one of the dimensions of knowledge management, which allows teamwork, with research groups in the writing of paper for publication in high quality journals and database in Scopus and web of Science (Gonzalvez et al., 2014). These evidence supports the relevance of information in educational productivity (Rojas-Pescio & Roa-Petrasic, 2021).

Knowledge management favors technological support (Rodríguez Gómez, 2006) and virtual environments facilitate innovation (Martínez Caro, 2009), with b-learning guiding planning as an alternative for improvement at the higher level (Gisbert Cervera et al., 2017), in that sense 1 The knowledge of this study is relevant for higher education institutions that strive to create a sustainable culture of academic research and grow a new generation of competent researchers (Rambe & Mbeo, 2017), collaborative work is strengthened by pedagogical and didactic activities, through knowledge management (Vásquez, 2014); Likewise, organizational learning opens opportunities for leadership, sharing necessary resources, generating knowledge and sustaining long-term strategies (Agudelo and Arias, 2018). This evidence supports that teachers socialize with group work and exhibitions generating knowledge (Escobar Sarria et al., 2013).

Maintaining a low social interaction in a sustained manner in various scenarios to avoid a new post-quarantine outbreak, only then could a high probability of epidemic control be had (Huamaní et al., 2020). It is endorsed that patients with chronic and risk diseases are controlled in the current health emergency, through a better transferability of knowledge between the scientific and citizen communities (Ricadat et al., 2021), in that sense the incorporation of new virtual platforms have increased academic effectiveness (Acevedo-Correa et al., 2019). Likewise, research management favors the publication of scientific articles (Valles-Coral, 2019). This evidence affirms that knowledge management helps to strengthen decisions and educational quality (Barzaga Sablón et al., 2019). In the same vein, teachers' knowledge management is increased through factors such as

organizational leadership, communication and management of information technologies (Salgado et al., 2017); likewise, knowledge management supports teachers who do not have knowledge of technology and updating through technological support (Guggemos & Seufert, 2021). This evidence confirms that teachers manage their own knowledge in the era of cloud education (Hsu & Chen, 2019).

In Peru, higher education trains technical professionals in the various areas and technology, to contribute to their personal, inclusive social development and work environment. With employability skills that contribute to the development of the country and the sustainability of the environment (Minedu, 2016); is harmonized with the cognitive aspects of understanding, executing, summarizing, examining and innovating (Qadir & Al-Fuqaha, 2020), it is evident that b-learning from a general perspective oriented to the planning of its use in the education superior as a strategy of change of organizational character (Salinas et al., 2018); and The second epidemiological resurgence continued with teaching in virtual classrooms, increasing strategies in which students share knowledge, decision-making based on collective reflection online (Castaneda & Cuellar, 2021). Finally, it was determined that there is a high and significant incidence ($r=0.854$) between emotional intelligence and knowledge management in the staff of the Provincial Municipality of Cañete (Oseda et al., 2019).

In Peru, it favors teachers in their pedagogical practice for their good academic performance (Galindo et al., 2021). Knowledge management in the educational process reinforces students' training, in addition to being able to apply this knowledge in their professional and personal lives, contributing to the acquisition of knowledge, skills and attitudes (Mareque & Prada, 2018). In the students of the Instituto Superior Tecnológica Erasmo Arellano Guillén, of Pataz, reflected the regular academic level that corresponds to 26 students and that represents 44.1% of the sample, which suggests that students and teachers should be involved continuously and permanently in the various educational contexts for their academic performance. That is why the teachers and students of the Pataz institute manage their own knowledge, which can contribute greatly to strengthen their education and therefore their integral formation.

In this sense, the study is relevant to the problem because the discussion of its results will derive the relevance of decision-making for the execution of reinforcement programs aimed at the student population of Pataz. It acquires importance as it contributes to improving organizational culture, internal culture, skills development and planning. promoting innovation, continuous updating through the transfer of knowledge, strengthens the culture of experiences among teachers, researchers and students.

By virtue of this, the basis of the factual and theoretical arguments previously put forward s and formulated the research question: To what extent does knowledge management influence the academic performance of students at the Erasmo Arellano Guillén Public Higher Technological Institute, Pataz-La Libertad? The objective of this study was to demonstrate to what extent knowledge management inflows in the academic performance of the students under study. As a hypothesis

of the research, it was pointed out that knowledge management inflows positively in the academic performance of mining students in times of health emergency.

Methodology

The research is quantitative, with explanatory scope of non-experimental design, cross-sectional, descriptive causal correlational. The population was made up of 141 students enrolled in the I, III and V Semester 2021-I. The Sample chosen through the intentional non-probabilistic sampling of 59 students of the population, of the III Semester 2021-I of the mining exploitation study program. With inclusion criteria, students of the III semester are considered for being doing intermediate practices in mining companies in the area, more students and the acceptance of voluntary participation in said research. Likewise, the exclusion criteria, students of I and V semester do not have voluntary acceptance due to availability of time and work occupations.

Data collection techniques:

The technique to collect and store data was the survey from the application of the instrument with questionnaire, using the technical sheet to measure the levels of knowledge management prepared by Velásquez (2018), which evaluates the dimensions: Dimension 1: Organizational culture of 08 items', Dimension 2: Internal culture of 06 items', Dimension 3: Development of competencies of 05 items', Dimension 4: Planning of 05 items', being a total of 24 items, with 5 answer options Never = 1, Almost never = 2, Sometimes = 3, Almost always = 4 and Always = 5. Likewise, the instrument was applied to a pilot sample, with whose data the validity was carried out with confirmatory factor analysis with KMO of adaptation to sampling = 0.753 and sig. < 0.01 with 76.72% accumulated of the total variance explained by four components with average values of homogeneity:

Organizational culture 0.837, Internal culture 0.847, Competence development 0.741, Planning 0.729, continuing with the calculation of reliability with alpha Cronbach of α Knowledge management = 0.849, with α Organizational culture = 0.841, α Internal culture = 0.834, α Skills development = 0.826, α Planning = 0.828. Which are considered statistically significant reliability.

For the second instrument Academic performance with the questionnaire, using the technical sheet to measure the levels of academic performance prepared by Rodríguez et al. (2001), which evaluates the dimensions: Dimension 1: Conceptual of 07 items, Dimension 2: Procedural of 06 items, Dimension 3: Attitudinal of 04 items, Being a total of 17 items, with 5 answer options No = 0, Sometimes = 1, Regularly = 2, Many times = 3 and If = 4. Likewise, the instrument was applied to a pilot sample, with whose data the validity was carried out with confirmatory factor analysis with KMO of adaptation to the sampling = 0.767 and sig. < 0.01 with 52.637% accumulated of the total variance explained by three components with average values of homogeneity: Conceptual '0.648', Procedural '0.647', Attitudinal '0.622', continuing with the calculation of reliability with alpha Cronbach of α Academic performance = 0.852, with Conceptual α = 0.821, Procedural α = 0.821, Attitudinal α = 0.840. Which are considered

statistically significant reliability. In this sense, confirmatory factor analysis was performed to demonstrate the validity of the factorial structure previously obtained with exploratory factor analysis to obtain evidence of validity (Pérez-Gil et al., 2000).

The information of the same students was collected via the form on the use of knowledge management, the responses of the survey form were also received in the Excel database, the acceptance and authorization of the director of the institution was obtained, also the students were informed about the reasons for the evaluation and the voluntary nature of their participation in the research and the confidentiality of the Answers. Before the application of the survey, the students were guided by their e-mail, how to make the answer by executing the corresponding link. (Agustin Mawarni et al., 2020).

The data were entered into the SPSS v. 25 program, the validity analysis was executed with confirmatory factor analysis and reliability with Cronbach's Alpha; the descriptive part with prescription of levels and analysis of frequencies and percentages of the variables and subvariables; the normality test was executed, identifying that the variables with their dimensions detect a non-parametric distribution (some sig. <0.05), so the Rho Spearman statistical test for measuring correlations with significance ($p < 0.05$) was applied in the inferential part; for the measurement of the impact of knowledge management on academic performance, linear regression was used.

Results

Levels and dimensions of knowledge management

Table 1. Levels and dimensions of knowledge management, in Covid-19

Dimensions	Organizational Culture		Internal communication		Skills development		Planning	
	f	%	f	%	f	%	f	%
Deficient	23	39,0	8	13,6	18	30,5	18	30,5
Regular	36	61,0	19	32,2	22	37,3	22	37,3
Good	00	0,0	32	54,2	19	32,2	19	32,2
Very good	00	0,00	00	0,00	00	0,00	00	0,00
Total	59	100,0	59	100,0	59	100,0	59	100,0

As can be seen in Table 1, learners are placed with greater supremacy at the middle level in the organizational culture dimension (61.0%, 36), followed by the good level in the internal communication dimension (54.2%, 32). Remaining in less supremacy in the middle level in the dimensions development of competences and planning with (37.3%, 22) both.

Levels and dimensions of academic performance

Table 2. Levels and dimensions of academic performance, in Covid-19

Dimensions/Variable	Conceptual	Procedural	Attitudinal
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Levels	f	%	f	%	f	%
Deficient	8	13,6	9	15,3	10	16,9
Regular	26	44,1	25	42,4	22	37,3
Good	18	30,5	18	30,5	23	39,0
Very good	7	11,9	7	11,9	4	6,8
Total	59	100%	59	100%	59	100%

The learners, according to Table 2, are located with greater hegemony at the regular level of the conceptual dimension (4 4.1%, 26), followed by the regular level in the procedural dimension (42.4%, 25) and at the lowest hegemony at the good level in the attitudinal dimension (39. 0%, 2(3).

Relationship of knowledge management and academic performance

Table 3. Relationship between knowledge management and academic performance, in times of pandemic

Rho Correlation	Spearman	Conceptual	Procedural	Attitudinal	Performance Academician
Knowledge management	,844**	,836**	,786**	,843**	
Sig. (bilateral)	,000	,000	,000	,000	

Table 3 shows the existence of a highly significant relationship between knowledge management and academic performance and its conceptual, procedural, attitudinal dimensions with values ($r = 0.843^{**}$; $r = 0.844^{**}$; $r = 0.836^{**}$; $r = 0.786^{**}$; $\forall p < 0.01$).

Predictors of knowledge management in academic performance

Table 4. Predictors of knowledge management in academic performance and its subvariates, in times of pandemic

Model	R	R square	Tight square	Standard error of the estimate
Knowledge management/Academic performance	,920 ^a	,847	,844	5,206
Knowledge management/Conceptual	,897 ^a	,804	,801	2,582
Knowledge management/Procedural	,894 ^a	,800	,796	2,087
Knowledge management/Attitudinal	,770 ^a	,593	,586	2,338

As evidenced in Table 4, Knowledge Management significantly influences academic performance, conceptual, procedural, attitudinal subvariates, whose values are ($r^2 = 84.7\%$; $r^2 = 80.4\%$; $r^2 = 80.0\%$; $r^2 = 59.3\%$; $V p < 0.01$).

Discussion

The results regarding the use of knowledge management show that learners are placed with greater supremacy in the middle level of the organizational culture dimension (61.0%, 36), followed by the good level in the internal communication

dimension (54.2%, 32). Finally, it was evidenced in the deficient level in the organizational culture dimension (39.0%, 23). Therefore, a vocational orientation of knowledge management should be employed, which strengthens the development, growth, integration and cooperation of teachers for the benefit of learners (Fernandez & Shaw, 2020).

With respect to academic performance, they are located with greater hegemony at the regular level of the conceptual dimension (44.1%, 26), followed by the good level in the attitudinal dimension (39.0%, 23), and the deficient level in the attitudinal dimension (16.9%, 10). Finally, it was evidenced at the very good level in the conceptual and procedural dimensions respectively (11.9%, 7). This decrease in health emergency had a substantial impact on students and the virtual irruption in education caused significant psychological depressions. The objective of studying was to evaluate the factors associated with their academic performance and knowledge management, absence of accompaniment to the study and the use of ICTs among medical students during the period of home quarantine (Arima et al., 2020). In this sense, the study is relevant to the subject and the use of technologies by its teachers and students encourage the development of cognitive skills activities according to academic training (Alsuraihi et al., 2016). According to the results, mined (2016) states that academic performance consists of the student interpreting, modifying and optimizing knowledge during the development of learning activities and social practices, involving the articulation of the processes of search, selection and evaluation of information.

A highly significant relationship was found between knowledge management, organizational culture, internal communication, competence development and planning with academic performance and its conceptual, procedural and attitudinal dimensions ($r = 0.844^{**}$, $p < 0.01$ high positive relationship; $r = 0.836^{**}$, $p < 0.01$ high positive relationship; $r = 0.786^{*}$, $p < 0.01$ high positive relationship; $r = 0.843^{**}$, $p < 0.01$ high positive ratio). Knowledge management, organizational culture, internal communication, skills development and planning, significantly favor academic performance and its conceptual, procedural and attitudinal dimensions whose values ($r^2 = 84.7\%$; $r^2 = 80.4\%$; $r^2 = 80.0\%$; $r^2 = 59.3\%$; $\forall p < 0.01$). Supported by the above assessments, it is agreed that there is a positive relationship in the knowledge management process and academic performance (Regression coefficient $r^2 = 0.758$, this indicates that knowledge management has a high and significant impact on academic performance (Kaldeen et al., 2020). These evidences are supported with a KMO= 0.792, a reliability of 0.855 and a chi-square distribution = $\chi^2 = 65.788$ and $p = 0.112$ statistically significant at 0.05; where knowledge management was found to have a significant influence on academic performance, so that universities are supported in the implementation of policies to build a culture of knowledge (Pudjiarti et al., 2022).

In Peru, the study confirmed that it determined the relationship between knowledge management and academic performance, with a sample of 154 students, with a quantitative approach, with non-experimental design, hypothetical deductive method; with reliability of 0.929 and 0.869 respectively. Results were obtained that there is a direct relationship between knowledge

management and academic performance with a value of 0.830 for the Spearman correlation coefficient. Concluding that there is a significant relationship between knowledge management and its academic performance among students of the mechanical engineering specialty at a particular university in Lima (Ocaña Fernández et al., 2019). Finally, these evidences are supported with the results that indicate that there is a high correlation coefficient 0.819 and Sig. (bilateral / p value) = 0.001. the impact of knowledge management on academic performance shows a link, direct and significant, between the two, with values higher than 97%. Additionally, students consider that their performance has improved due to the knowledge acquired and, as a result, almost 95% of students have been evaluated between good and excellent (Álvarez et al., 2021).

Conclusions

Managing knowledge has progressively become a fundamental strategy for organizations, which does not exempt higher education institutions, due to the amount of information currently available, in a globalized and interconnected society. Therefore, transforming information into knowledge is a key action, if knowledge is appreciated as the intangible capital that it is. In this way, the models, both knowledge and knowledge management, represent best practices in current organizations and specifically in the Institutions of higher education, which have the role of being change managers for creation, dissemination, learning and innovation. This justifies the investment in platforms, software and infrastructures that allow the establishment of networks to share and renew knowledge.

The results reveal that the use of knowledge management shows that learners are located with greater supremacy at the middle level in the variable knowledge management (76.3%, 45), followed by the good level in the internal communication dimension (54.2%, 32). Finally, it was evidenced in the deficient level in the organizational culture dimension (39.0%, 23). It is concluded that students should strengthen the organizational culture through tutoring and training by teachers.

With respect to academic performance, they are located with greater hegemony in the good level of the variable academic performance (45.8%, 27), followed by the regular level in the conceptual dimension (44.1%, 26), and the deficient level in the attitudinal dimension (16.9%, 10). Finally, it is evidenced or in the very good level in the conceptual and procedural dimensions respectively (11.9%, 7). It is concluded that the attitudinal dimension such as values, norms and soft skills should be strengthened.

A highly significant relationship was found between the use of Knowledge Management, organizational culture, internal communication, competence development and planning with academic performance and its conceptual, procedural and attitudinal dimensions ($r = 0.844^{**}$, $p < 0.01$ high positive relationship; $r = 0.836^{**}$, $p < 0.01$ high positive relationship; $r = 0.786^{*}$, $p < 0.01$ high positive relationship; $r = 0.843^{**}$, $p < 0.01$ high positive ratio), of the students of the Higher Technological Institute of Mining of Patate in times of bread. It is

concluded that all teachers and students of the mining institute have the orientation to carry out knowledge management for their respective learnings.

Knowledge management, organizational culture, internal communication, skills development and planning, significantly favor academic performance and its conceptual, procedural and attitudinal dimensions whose values ($r^2 = 84.7\%$; $r^2 = 80.4\%$; $r^2 = 80.0\%$; $r^2 = 59.3\%$; $\forall p < 0.01$). It is concluded that this research allows to make a pedagogical contribution with the incidence of knowledge management and academic performance in higher level students for continuous improvement.

Recomendations

- Consequently, higher education institutions (HEIs) are called to carry out multiple activities that lead to capture, store, share and disseminate knowledge, in order to improve educational services in terms of productivity, greater innovation and creativity.
- Therefore, it is recommended that the scientific and academic community focus on exploring in greater depth not only the benefits that knowledge management can bring to organizations in the education sector, but also estimate the associated costs; as this will provide a clear picture to educational management groups on the relevance of incorporating this type of strategies in the institutions of higher education.

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