Pensamiento Educativo. Revista de Investigación Educacional Latinoamericana
2022, *59*(1), 1-14

Pontificia Universidad Católica de Chile
Facultad de Educación

Attitudes and Capabilities of Teachers Towards Educational Innovation. The Views of Students

Actitudes y capacidades de los docentes frente a la innovación educativa. La mirada de los estudiantes

Jaime Constenla Núñez, Angélica Vera Sagredo, & Pilar Jara- Coatt
Universidad Católica de la Santísima Concepción

Abstract

This research sought to determine the attitudes and capabilities of teachers towards educational innovation from the perspective of 828 students from 19 educational establishments in the Biobío region of Chile. In order to answer the research questions, we conducted comparative analyses of mean differences using ANOVA, the t-test, and correlations using Pearson's coefficient. The main results show that teachers are generally highly rated by students in terms of the characteristics of an innovative teacher, particularly regarding respect (84.7%), disposition (86.9%), commitment (82%), and vocation (81.1%). However, they are less well rated on the use of technological tools such as email and social networks to support the teaching-learning process. In addition, women appear to have a higher opinion of some characteristics of teachers linked to interpersonal relationships. Finally, the correlations revealed a positive and significant relationship for the variables examined with respect to the students' gender.

Keywords: Educational innovations, teacher qualifications, information technologies

Post to:
Jaime Constenla Núñez
Alonso Ribera 2850, Concepción, Chile
jconsten@ucsc.cl
ORCID: 0000-0002-3373-6888

ISSN:0719-0409 DDI:203.262, Santiago, Chile doi: 10.7764/PEL.59.1.2022.7

Resumen

Esta investigación buscó determinar las actitudes y capacidades de los docentes frente a la innovación educativa desde la percepción de 828 estudiantes de 19 establecimientos educacionales de la región del Biobío, Chile. Para dar respuesta a las preguntas de investigación, se realizaron análisis comparativos de diferencias de medias a través de ANOVA, prueba t y las correlaciones mediante el coeficiente de Pearson. Los principales resultados muestran que el profesorado en general es bien valorado respecto de las características de un docente innovador, especialmente en lo relativo al respeto (84,7%), la disposición (86,9%), el compromiso (82%) y la vocación (81,1%). Sin embargo, se evidenciaría una menor apreciación en el uso de herramientas tecnológicas, como el correo electrónico y las redes sociales, para el apoyo en los procesos de enseñanza-aprendizaje. Asimismo, las mujeres tendrían una valoración mayor en algunas características del profesorado vinculado con las relaciones interpersonales. Finalmente, las correlaciones mostraron una relación positiva y significativa de las variables examinadas con respecto al género de los estudiantes.

Palabras clave: innovación educacional, competencias del docente, tecnologías de la información

Introduction

There is a broad consensus on the importance of innovation in education, particularly because educational systems have entered into a dynamic of change that is expected to respond to the various educational, national, and international policies to meet the new demands of society (Díaz-Barriga, 2010; Serdyukov, 2017). Zabalza (2003-2004) contends that innovation implies being able to introduce changes that are justified and their quality depends on how valuable the change itself is and on its justifications. Various authors consider that pedagogical innovation is one of the key factors when it comes to improving teaching-learning processes, because it makes it possible to address solutions for problems of quality, coverage, efficiency, and efficacy in the educational field through flexible actions that involve better meeting the needs of the school community (Altopiedi & Murillo, 2010; Blanco & Messina, 2000; Manola et al., 2017; Margalef & Arenas, 2006; Morales, 2010). According to Lamas and Lalueza (2016), innovating entails incorporating new measures or, in other words, "new ways of operating, new roles, new rules of operation, and new ways of relating to their students" (p. 256). In order to achieve this, at least one agent of change is required (Pascual, 2019), who will be the mainstay of the innovation; in this case, the teacher (Cargua et al., 2019).

From this perspective, it is essential to understand that the modernization and improvement of educational quality can be achieved in parallel with improving the innovative activity of the teacher (Nikolaevna, 2019). Therefore, it can be understood that the key to a prosperous society depends on revitalizing the educational system, its structures, and tools, and updating the educational community, thus generating autonomy, self-efficacy, critical thinking, creativity, and progress in innovation (Serdyukov, 2017). Similarly, innovation is expected to be flexible and to have a capacity for adaptation, where new models are introduced that update teaching systems and incorporate new knowledge and available resources. In order to achieve this, it is essential to have an explicit willingness to update the processes that lead to educational improvement (Zabalza, 2003-2004). For innovation to make sense, it requires professional practice that is open, up-to-date, and which includes a proposal

for continuous improvement. It is clear that teachers in educational institutions are accustomed to having to adapt to changes, no matter difficult they may seem. This challenges them to be innovative and make learning increasingly relevant, challenging, inclusive, and rewarding (Trimmer et al., 2020).

By the same token, educational innovations must consider the learning needs of students; the actions that lead to new proposals must be continuous so that innovation promotes profound, extensive, and sustainable changes (López et al., 2014; Zavala-Guirado et al., 2020). Meanwhile, Serdyukov (2017) states that, in order to improve educational practices, it is essential to drastically optimize the efficiency and quality of the theory and practice of teaching and learning, as well as the roles of the student, the teacher, the parents, and the community, where the culture of society is the main focus of the changes. All of this lies in the fact that the higher the level of innovation in educational services, the higher the level of innovation in teaching-learning processes to achieve better academic outcomes among students (Zacharoula, 2020). Similarly, Deppeler and Aikens (2020) argue that there is widespread agreement that innovative teaching environments can support better learning outcomes and increased well-being for the school staff and their students. However, schools do not always achieve these outcomes, mainly because there is a disconnect between intentions, instructional design, and their own needs.

Fullan (2002) and Fuentealba and Imbarack (2014) make an important point about innovation, emphasizing that changes cannot be imposed, since they involve slow growth, due to the fact that the processes of appropriation and adoption imply gradual development because of the multiplicity of variables involved in actions to innovate in teaching, which may entail strengthening, stressing, or reducing the commitment of the innovation team and its future actions. Granados et al. (2020) contend that educational innovations should consider the characteristics of the students, the context, and the available resources, and the monitoring and assessment instruments should be determined as a strategy for mediation and support during the development of the various actions that enable change. Vásquez-Cano et al. (2019) state that innovation is a normative requirement, but not only that, because it is also an intrinsic need of the teaching praxis and the organization of educational centers. The teacher must therefore seek new methodological strategies that take into account a participatory and analytical perspective and thus be an agent of change.

With regard to the attitudes shown by teachers towards educational innovations and processes of change for the current generations, a number of studies have shown that educators are not generally resistant to change (Álvarez et al., 2011; Hengeveld, 2004; Mata & Acevedo, 2010; Meneses, 2017). This can be seen in the research by Hengeveld (2004), who explains that teachers display positive attitudes and feel comfortable and willing to carry out different actions to support their students. Meneses (2017) also points out that teachers demonstrate a positive attitude towards innovation and are pleased to be committed, trained, and work as a team to implement new actions. However, despite the positive attitude of teachers, it is clear that the incorporation of changes into school culture may present certain difficulties, such as in relation to its structure, the school day, the leadership of authorities, or the involvement of families. On the other hand, teachers may not have been trained for innovation, since, for example, in their initial teacher training they would have been provided with activities that are ready to carry out and there may be no training on the creation of original educational products (Nikolaevna, 2019).

Some authors suggest that an innovative teacher is one who has a positive attitude towards students and their educational needs (Ríos, 2009); their disciplinary content corresponds to updated curricula that are focused on the development of knowledge, attitudes, skills, and values (Lavín-Verástegui & Farías-Martínez, 2012); and they possess certain characteristics related to persistence, autonomy, creativity, order, change, achievement, and the ability to pose and solve problems (Ríos, 2004; Sancho et al., 2008). Cargua et al. (2019) argue that educational innovations require motivated teachers, with continuous training that enables them to be scientifically

and pedagogically aware of what they want to change; a teaching staff that provides job stability and a positive climate; and teachers who work collaboratively, creating professional networks and learning communities, and who construct and transfer knowledge creatively, fostering students' desire to learn in a meaningful way.

The innovations that really matter are those that respond to the demands and needs of the environment (Aramendi Jauregui, 2010; Arencibia & Moreno, 2010). Innovation would therefore be expected to emerge from the commitment of the educational community through a diagnosis of its problems, in which managers, teachers, and students work collectively, seeking and reflexively experimenting with various alternatives that support the needs of their school culture (Margalef & Arenas, 2006; Serdyukov, 2017). In line with this, educational establishments should ensure the curriculum is updated with didactic adjustments and timely assessments that allow the development of generic and specific competencies that promote student learning (Cid et al., 2017; Vargas, 2016). In the educational reality, it must be considered that, for teachers, any innovation implies a transformation in their practices, beliefs and values, which can often produce insecurities and unexpected impacts (Mayorga & Pascual, 2019).

As regards the students' opinion of their teachers, some studies suggest that their perception is not positive. This is indicated by Tello and Tello (2013), who state that the professional performance of teachers is worrying because, for example, they show weaknesses in the use of didactic tools for teaching. This is due to the lack of continuous updating in terms of technological advances and active strategies to achieve learning objectives. However, other authors demonstrate that students have a positive view of teaching activity, not only in their discipline, but also in terms of the motivational and emotional aspects of the teaching staff towards their students. Indeed, Tabera et al. (2015) and Gómez et al. (2016) report that students positively rate aspects such as the teacher's interest in maintaining a personal and close relationship with students through their ability to listen and show interest in topics that are important to them. Similarly, in the Chilean context, Sepúlveda et al. (2019) show that students believe that teachers help them overcome their difficulties, have a positive attitude, propose interesting topics, and motivate them, with these actions enabling good interpersonal relationships and allowing optimal educational development.

In this scenario, and according to Poblete-Valderrama et al. (2018), the perception of students is not always considered with regard to teacher improvement; however, as they are the main beneficiaries and recipients of teaching, they may be the best ones to assess it. Their opinion can therefore provide a significant reference point to be taken into account, although there are some reservations about how objective this assessment could be, either because of the personality of each individual or because of the expectations they have. Nevertheless, having a general reference point enables reflection on professional performance and the characteristics that students believe an innovative teacher should have.

Considering these points, this study addressed the following research questions: 1) What are the attitudes and capabilities of teachers towards innovation? 2) Are there differences between students' opinions in terms of gender, educational level, and age? 3) Is there a relationship between the variables examined with respect to the sociodemographic characteristics of the students?

Methodology

The research has been carried out following a quantitative approach with a non-experimental design of a descriptive correlational nature. In this context, the aim is to describe the properties and characteristics of a given phenomenon and to demonstrate the relationship or degree of association between two or more variables (Hernández et al., 2014).

Sample

The sample was selected by convenience using the non-probabilistic sampling technique, since this allowed the selection of all cases that were accessible and that agreed to be included in the research (Otzen & Manterola, 2017). The sample consisted of 828 students from 19 educational establishments in the Biobío region of Chile. The educational levels of the participants ranged from fifth grade to 12th grade; with 45.2% of them males (374) and 54.6% females (454). Their ages ranged from 9 to 20 years (Mean=16.23; *SD*=.567).

Instrument

For this research, we used an instrument adapted by the Innovapedia® Center of the Universidad Católica de la Santísima Concepción, Chile. The data was collected in the context of the project RITA (Red de Innovación Tecnológica en el Aula, or Classroom Technology Innovation Network) 17IIPBB-83356, with the Central China Normal University of Hubei, funded by the Biobío Regional Productive Development Committee of the Chilean Production Development Corporation (CORFO).

Attitudes and capabilities of teachers towards educational innovation, student version (ACDIE).

This instrument gave us an insight into students' perceptions of teachers' attitudes and capabilities towards educational innovation (Mazón et al., 2009; Rocha, 2013; Traver-Martí & Fernández-Berrueco, 2016). It includes 35 items and the students' responses were measured using the Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5), with statements such as: The class is carried out in a respectful environment; When a concept is not clear, the teacher explains it another way; The teacher uses information and communication technologies (ICT) such as educational platforms, videos, etc. The factor analysis confirms the 1-factor model, as it shows adequate fit indices: χ^2SB = 1,972.558; p=.000; CFI =.96; NNFI=.96, RMSEA=.050. Cronbach's alpha is .94. All indices are considered appropriate (Hu & Bentler, 1999).

Procedure

The data collection instrument was applied in a collective, organized, and scheduled manner in order to avoid interfering with the students' academic activities. Informed consent was obtained, in line with national and international ethical standards. All participants responded to the instruments voluntarily and were assured of the confidentiality and anonymity of their responses.

Data analysis

In order to establish possible differences between the students' responses on their teachers' attitudes and capabilities towards educational innovation according to the different sociodemographic characteristics (gender, age, educational level), a comparative analysis of their means was carried out to assess whether they differed significantly. These analyses were performed using the Student t-test for independent groups and ANOVA. Pearson's correlation coefficient was also used to establish possible correlations between the students' opinions. Before performing the analyses outlined in the research objectives, the assumptions of normality (Kolmogorov-Smirnov), homogeneity (Levene) and independence were checked. The software programs SPSS v. 21 and Factor Analysis v. 10.10.01 were used for all of these analyses.

Results

In the following section we present the results in order to answer the research questions.

Descriptive analysis of teachers' attitudes and capabilities towards educational innovation as perceived by their students

The descriptive analyses show that the students generally have a positive view of the teachers' work. The items that produced the highest positive ratings (agree and strongly agree) were in the following statements: the teacher is respectful with the students (84.7%); the teacher is willing to help the students (86.9%); when the teacher shows motivation towards teaching, the student's motivation for learning will be higher (82.7%); the teacher shows vocation for teaching (81.1%); and, the teacher is a committed professional (82%). On the other hand, the items where the students feel that their teachers showed weaker performances in their professional work were demonstrated in the statements that the teacher uses communication media through the internet such as e-mail or social networks and that the teacher does not motivate students to search for information autonomously.

Table 1
Descriptive analysis of students' perceptions of the teacher's attitudes and capabilities

Items	Min.	Max.	Mean	Standard Deviation
The teacher's teaching method promotes learning of the contents of the course (practice).	0	5	3.92	1.025
The teacher is respectful with the students.	0	5	4.31	.932
The class is carried out in an atmosphere of respect.	0	5	3.82	1.061
The exams the teacher administers assess understanding of the topics.	0	5	4.09	.985
When a concept is not clear, the teacher explains it another way.	0	5	4.07	1.045
The teacher is willing to help us.	0	5	4.41	.948
The teacher takes the students' opinions into account.	0	5	4.11	1.070
The teacher uses information and communication technologies (ICT), such as educational platforms, videos, etc.	0	45	4.02	1.763
The teacher is an example of professional quality because of their ability to teach.	0	5	4.16	.960
From the outset, the teacher specified the forms of assessment of the subject matter.	0	5	4.07	.977
The teacher uses communication media through the internet such as e-mail or social networks.	0	5	3.40	1.264
The teacher motivates me to search for information on my own.	0	5	3.70	1.154
The teacher is concerned about with relating what has been seen in class with applications or practical cases.	0	5	3.79	1.069
The teacher has made me feel satisfied attending their classes.	0	5	3.89	1.082
The teacher's forms of assessment are appropriate and fair.	0	5	4.03	1.026
I believe that the teacher has to support the student's learning by providing guidance and direction.	0	5	4.19	.988

The teacher provides examples of possible practical applications of the content reviewed.	0	5	3.89	.972
I believe that the use of new teaching methods is necessary to improve teaching practice.	0	5	4.13	1.070
The students' performance will improve if the teacher is close to them.	0	5	4.09	1.079
The level required in the teacher's assessments corresponds to the level at which the classes are taught.	0	5	3.99	.968
I am convinced that the higher the teacher's motivation towards teaching, the higher the student's motivation towards learning.	0	5	4.30	.976
The teacher helps me overcome problems related to my learning in class.	0	5	4.09	.997
The teacher frequently resolves conflicts with students in this class.	0	5	3.95	1.103
The teacher takes my knowledge into account to facilitate my learning.	0	5	3.90	1.100
The teacher encourages my active participation.	0	5	3.91	.996
The teacher shows a vocation for teaching.	0	6	4.25	.989
I respect the teacher as a committed teacher.	0	5	4.25	1.061
The teacher assigns grades that reflect the students' knowledge of the course content.	0	5	4.04	.928
The teacher is fair to the students when assigning a grade.	0	5	4.11	1.009
The teacher encourages my personal reflection.	0	5	3.87	1.020
I feel listened to by the teacher.	0	5	3.90	1.169
The teacher conducts a review when they identify that most of the students lack the knowledge needed to tackle a topic successfully.	0	5	4.19	.992
The teacher manages to keep us motivated and interested in the contents of the subject.	0	5	3.82	1.045
The teacher promotes the participation of all students when performing activities.	0	5	3.92	1.003
In order to bring innovative proposals to the classroom, teachers must have a continuous process of training and renewal.	0	5	4.11	.972

Source: Prepared by the authors.

Differences between students' perceptions of their teachers' attitudes and capabilities towards educational innovation according to gender, educational level, and age

In the students' perceptions of their teachers' attitudes and capabilities towards educational innovation, we observed that there are generally no significant differences between male and female students. However, as can be seen in Table 2, there are statistically significant differences in some items of the instrument. These show that the group of female students considers, to a greater extent than the group of men, that the teacher is respectful with the students, supports the student's learning by providing guidance and orientation, considers the students' knowledge to promote learning; is committed; is fair with the students when assigning grades; and is able to motivate and interest them in the contents of the subject. It is also clear that the female students feel that it is important for teachers to use new teaching methods, that they are motivated towards teaching, and that, in order to bring innovative proposals to the classroom, teachers must have a continuous process of training and renewal.

Table 2
Differences in students' perceptions according to gender.

Items	Males		Females			
	M	*SD*	*M*	*SD*	*t*	*Sig*
The teacher is respectful with the students.	4.24	.979	4.38	.887	2.177	.030
I believe that the teacher has to support the student's learning by providing guidance and direction.	4.04	1.001	4.31	.961	4.060	.000
I believe that the use of new teaching methods is necessary to improve teaching practice.	3.99	1.125	4.23	1.011	3.214	.001
I am convinced that the higher the teacher's motivation towards teaching, the higher the student's motivation towards learning.	4.19	1.041	4.39	.911	2.908	.004
The teacher takes my knowledge into account to facilitate my learning.	3.79	1.128	4.00	1.068	2.824	.005
I respect the teacher as a committed teacher.	4.07	1.196	4.39	.913	4.264	.000
The teacher is fair to the students when assigning a grade.	4.03	1.057	4.18	.964	2.043	.041
The teacher manages to keep us motivated and interested in the contents of the subject.	3.73	1.061	3.90	1.027	2.319	.021
In order to bring innovative proposals to the classroom, teachers must have a continuous process of training and renewal.	4.01	1.036	4.19	.910	2.689	.007

Source: Prepared by the authors.

When analyzing the different variables in terms of educational level, we observe that there are significant differences in the item stating that the class takes place in a respectful environment ($F(7.816)=3.262$, $p<.05$). The multiple comparisons indicate that there are differences between eighth-grade students and third-grade students (M8th=3.61, SD=1.065; M3rd=4.00, SD=1.048), indicating that students in higher grades more frequently believe that there is a good classroom environment. Significant differences are also observed in the students' perception of the teacher's use of communication media through the internet, such as e-mail or social networks ($F(7.816)$ =7.713, $p<.05$). The comparisons indicate that differences are found between eighth-grade students and third-grade students (M8th=3.01, SD=1.288; M3rd=3.68, SD=1.207), and second grade students (M8th =3.01, SD=1.288; M2nd=3.74, SD=1.121).

Statistically significant differences were also observed regarding the use of new teaching methods being necessary to improve teaching practice ($F(7.816)=2.603$, $p<.05$). The multiple comparisons show that the differences occur in eighth-grade students and fourth-grade students (M8th=3.93, SD=1.115; M4th=4.34, SD=.914). Significant differences are also observed when indicating that student performance will improve if the teacher has a close relationship with the students ($F(7.816)=2.763$, $p<.05$). The comparisons show that there are significant differences between groups of students who are in seventh grade and those in fourth grade (M7th=3.82, SD=1.162; M4th=4.27, SD=.988). Finally, significant differences are also observed in relation to the educational level in the statement that, in order to bring innovative proposals to the classroom, teachers must have a continuous process of training and renewal ($F(7.816)=2.716$, $p<.05$). Differences were found in this item between the groups of eighth-grade and third-grade students (M8th=3.86, SD=.996; M3rd=4.23, SD=.947).

As regards the perceptions of the students according to their age, we can see that there are statistically significant differences in the item that states that the class takes place in a respectful environment (F(11.816)=3.695, p<.05). The multiple comparisons show that there are differences between 13-year-old students and 15-year-old students (M13=3.36, SD=1.103; M15=4.07, SD=.872) and between 16-year-old students (M13=3.36, SD=1.103; M16=3.92, SD=1.038). Differences were also seen in the statement that the teacher uses communication media through the internet, such as e-mail or social networks (F(11.816)=5.485, p<.05). The multiple comparisons demonstrate that there are statistically significant differences between the 13-year-old students and the 16-year-old group (M13=2.97, SD=1.248; M16=3.61, SD=1.184), with the 17-year-old group (M13=2.97, SD=1.248; M17=3.57, SD=1.220), and with the 18-year-old group (M13=2.97, SD=1.248; M17=3.84, SD=1.206).

Correlation between the different variables analyzed with regard to the demographic variables

In this section, the regression method was used to obtain an estimate of the factor scores for the items with the highest scores in the descriptive analyses and the sociodemographic variables analyzed.

Table 3
Correlations between teachers' attitudes and capabilities with higher scores for educational innovation.

	They are respectful with the students.	The teacher is willing to help us.	The higher the teacher's motivation towards teaching …	The teacher shows a vocation for teaching.	I respect the teacher as a committed teacher.
Gender	.076*	.069*	.101**	.090**	.147**
Age	.004	-.046	.008	-.019	.017
Grade	.029	-.025	.057	.001	.063
The teacher is respectful with the students.		.477**	.427**	.405**	.388**
The teacher is willing to help us.			.398**	.462**	.396**
The higher the teacher's motivation towards teaching …			.342**	.393**	.101**
The teacher shows a vocation for teaching.				.434**	.090**
I respect the teacher as a committed teacher.					.147**

** *The correlation is significant at level 0.01 (2-tailed).*

* *The correlation is significant at level 0.05 (2-tailed).*

Source: Prepared by the authors.

We specifically observed that the students' gender correlated with all the items that received high scores in the descriptive analyses; that is, a significant correlation was seen in the statements that the teacher is respectful with the students (r=.076, p<.005); the teacher is willing to help (r=.069, p<.005); the higher the teacher's motivation towards teaching, the higher the motivation to learn (r=.101, p<.001); the teacher shows vocation for teaching

(r=.090, p<.001), and the students respect the teacher as a committed teacher (r=.147, p<.001). No significant correlations were found with regard to the age and educational level. With respect to the different statements, we observed that all of the items analyzed correlate with each other.

Discussion

According to the analysis of the information collected during the research and with respect to the questions established for this study, we can feasibly conclude that the students generally have a positive view of teachers' work regarding educational innovation, unlike the study carried out by Tello and Tello (2013), who warn that—according to students' perceptions—teachers show weaknesses regarding the use of tools for teaching, because they do not adapt to the large changes arising from modern society.

In contrast with this, we observed that the main characteristics rated positively by students are that teachers are respectful, willing to help, committed, that they have a vocation, and that the more motivated the teacher is to teach, the greater the student's motivation to learn. These results are consistent with other research that reports that students have positive views of teachers' work, not only in relevant aspects such as disciplinary knowledge, but also in other factors such as vocation, support, and the attitude of the teacher towards their students (Gómez et al., 2016; Tabera et al., 2015). For example, in the study by Sepúlveda et al. (2019), the perception of the students regarding their teachers is positive, as they value the support of the teaching staff to overcome their difficulties and for the learning they provide them. This translates into a positive attitude of the student towards learning, which contributes to a good interpersonal relationship and enables optimal school development. In this context, we can suggest that the students' responses show the importance they attribute to certain attitudes of the teachers, which would be part of the characteristics of innovation.

On the other hand, the analyses produced low scores regarding the use of certain technological tools, such as e-mail and social networks. This could be due to the fact that effective application of information and communication technologies (ICT) requires significant time and effort on the part of the teacher, a factor that means that many teachers may not develop technological practices (Sáez, 2010). This could also be because of the quality of professional training (Mendoza, 2019) or the lack of technological infrastructure in educational institutions (Pérez, 2019). Another weak point in terms of teachers' capabilities and attitudes can be observed in the statement regarding the teacher's failure to motivate their students to search for information autonomously. This could be influenced by the lack of use of technological tools, as indicated by the students' responses. In fact, some research shows that the use of technologies is recommended for students to develop self-regulation, since they enable interaction, communication, and access to information, which poses a challenge for teachers: to take advantage of ICTs to make students more conscious of their learning process and their own role in regulating their academic work (Núñez et al., 2020; Rodríguez, 2014). Similarly, teachers and students seem to have difficulties in moving from an academicist model, in which education is centered on the teacher, to an autonomous model, with greater commitment on the part of students (Espinoza-Freire et al., 2017; Rivas, 2019).

With respect to age and educational level, we observed statistically significant differences in some items of the instrument. Specifically, we can see that 15-year-old students have a more positive opinion of the atmosphere of respect in the classroom. Similarly, 17-year-old students are more satisfied with the teacher's use of communication media through the internet, such as e-mail or social networks. As in the study by Yuste (2015), these results indicate that young people see the internet and social media as their natural habitat, due to their interaction and the amount of information found in those spaces. For this reason, the digital setting arouses huge expectations when communicating with others and, in this case, when evaluating interactions with teachers. As regards the

educational level, we can see that students who are in the highest grades (11th and 12th grades) are more positive about the use of new teaching methods by teachers and the closeness that teachers have with their students, and they also believe that teachers should have a continuous process of training and renewal to make their classes a space for educational innovation. The correlation results show that gender is related to all the items that obtained high scores in the descriptive analyses. However, no significant correlations were found for age and educational level.

Conclusions

In response to the first question of this study, we can state that the attitudes and capabilities of teachers towards innovation from the perception of their students are mainly linked to the respect that the teacher shows towards their students, the relevance of their assessments, closeness to students, provision of constant support, their motivation, and their vocation for teaching. As regards the second question, we found that there are some statistically significant differences according to the gender, educational level, and age of the students. In this context, we can see, for example, that women think certain characteristics of interpersonal relationships are more important, such as respect, fairness, support, and commitment of the teaching staff. They also believe it is necessary for teachers to direct, guide, and use new teaching methods to bring innovative proposals to the classroom, and to have a continuous process of training and renewal.

Generally speaking, we can conclude that innovation is not an easy process; on the contrary, it requires disposition, knowledge, motivation, time, and an attitude towards change. In this respect, students have a positive view of interactions with the teacher in the classroom and their characteristics as an innovative teacher. However, these characteristics could be enhanced by considering the students' perception of items not rated so highly, such as the use of ICT in the classroom. There is no doubt that innovation requires additional efforts associated with novelty and the dissemination of successful experiences.

Finally, we must mention that one of the limitations of this study is the use of a single research method, without the possibility of observing of teachers' innovative practices in the classroom or using other information-gathering techniques, such as interviews, focus groups, or participant observation, among others. The most important projected future uses of these findings would be to enrich the results with the perceptions of other members of educational institutions units, such as teachers and school administrators, regarding innovation in education.

Funding: Thanks to the Regional Productive Development Committee, CORFO, for funding the Project *RITA: Red de innovación tecnológica en el aula*, Biobío Region, Chile.

The original paper was received on September 14, 2020
The reviewed paper was received on December 16, 2020
The paper was accepted on March 31, 2021

References

Altopiedi, M., & Murillo, P. (2010). Prácticas innovadoras en escuelas orientadas hacia el cambio: ámbitos y modalidades. *Revista de curriculum y formación del profesorado*, *14*(1), 47-70. https://revistaseug.ugr.es/index.php/profesorado/article/view/20523

Álvarez, S., Cuéllar, C., López, B., Adrada, C., Anguiano, R., Bueno, A., Comas, I., & Gómez, S. (2011). Actitudes de los profesores ante la integración de las TIC en la práctica docente: estudio de un grupo de la universidad de Valladolid. *Edutec: Revista Electrónica de Tecnología Educativa*, (35), a160. https://doi.org/10.21556/edutec.2011.35.416

Aramendi Jauregui, P. (2010). La innovación educativa en Cantabria: calidad, equidad y apertura a la comunidad. *Profesorado: Revista de curriculum y formación del profesorado*, *14*(1), 153 – 170. https://revistaseug.ugr.es/index.php/profesorado/article/view/20533

Arencibia, J., & Moreno, J. (2010). La innovación educativa en España desde la perspectiva de grupos de discusión: El caso de la comunidad autónoma de Canarias. *Profesorado: Revista de currículum y formación del profesorado*, *14*(1), 191- 214. https://revistaseug.ugr.es/index.php/profesorado/article/view/20537

Blanco, R., & Messina, G. (2000). *Estado del arte sobre las innovaciones educativas en América Latina*. UNESCO.

Cargua, A., Posso-Pacheco, R., Cargua, N., & Rodríguez, Á. (2019). La formación del profesorado en el proceso de innovación y cambio educativo. *Olimpia: Publicación científica de la facultad de cultura física de la Universidad de Granma*, *16*(54), 140- 152. https://revistas.udg.co.cu/index.php/olimpia/article/view/713

Cid, J., Cuadra, L., Cuevas, S., & Villalobos, A. (2017). Articulación Educación y Trabajo: Un estudios desde la Mirada de los Docentes de la Educación Técnica Regional Chilena y sus Necesidades de Perfeccionamiento Pedagógico. *Información Tecnológica*, *28*(1), 25-34. https://doi.org/10.4067/S0718-07642017000100004

Deppeler, J., & Aikens, K. (2020). (2017). Responsible innovation in school design – a systematic review. *Journal of Responsible Innovation*, *7*(3), 573-597. https://doi.org/10.1080/23299460.2020.1809782

Díaz-Barriga, F. (2010). Los profesores ante las innovaciones curriculares. *RIES. Revista Iberoamericana de Educación Superior*, *1*(1), 37-57. https://doi.org/10.22201/iisue.20072872e.2010.1.15

Espinoza-Freire, E., Serrano, O., & Brito, P. (2017). El trabajo autónomo en estudiantes de la universidad técnica de Machala. *Universidad y Sociedad*, *9*(2), 202-212. https://rus.ucf.edu.cu/index.php/rus/article/view/569

Fuentealba, R., & Imbarack, P. (2014). Compromiso docente, una interpelación al sentido de la profesionalidad en tiempos de cambio. *Estudios Pedagógicos (Valdivia)*, *40*(Especial), 257-273. https://doi.org/10.4067/S0718-07052014000200015

Fullan, M. (2002). El significado del cambio educativo: un cuarto de siglo de aprendizaje. *Profesorado: Revista de currículum y formación del profesorado*, *6*(1–2), 1-14. https://revistaseug.ugr.es/index.php/profesorado/article/view/19173

Gómez, R., Díaz, B., Fernández, I., & Pérez, D. (2016). Percepción de estudiantes sobre el proceso enseñanza aprendizaje en la asignatura de Enfermería Pediátrica. *Revista Habanera de Ciencias Médicas*,*15*(4), 630-641. http://www.revhabanera.sld.cu/index.php/rhab/article/view/1173

Granados Romero, J. F., Vargas Pérez, C. V., & Vargas Pérez, R. A. (2020). La formación de profesionales competentes e innovadores mediante el uso de metodologías activas. *Universidad y Sociedad*, *12*(1), 343-349. https://rus.ucf.edu.cu/index.php/rus/article/view/1458

Hengeveld, K. (2004). Attitudes Towards Educational Innovations in Christian High Schools in Northwest Iowa and Southeast South Dakota (Tesis de maestría, Dordt University). https://digitalcollections.dordt.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1060&context=med_theses

Hernández, R., Fernández, C., & Baptista, P. (2014). *Metodología de la Investigación* (5a Ed.). McGraw-Hill.

Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives Structural Equation Modeling. *A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Lamas, M., & Lalueza, J. L. (2016). Innovar en el aula. Contradicciones entre nuevas herramientas y viejos roles como medio para trasformar la práctica. *Estudios pedagógicos (Valdivia)*, *42*(3), 243-258. https://doi.org/10.4067/S0718-07052016000400013

Lavín-Verástegui, J., & Farías-Martínez, G. (2012). Perfil y prácticas educativas del docente orientado a la innovación en las escuelas de negocios en México. *RIES. Revista Iberoamericana de Educación Superior, 3*(6), 117-127. https://doi.org/10.22201/iisue.20072872e.2012.6.58

López, M., Hinojosa, E., & Sánchez, D. (2014). Evaluación de la calidad de los proyectos de innovación docente universitaria. *Profesorado: Revista de currículum y formación del profesorado*, *18*(3), 377-391. https://revistaseug.ugr.es/index.php/profesorado/article/view/19358

Manola, J., Reiban, R., & Letamendi, C. (2017). Innovación en la educación superior. *Revista Publicando*, 4(11(1)), 719 -731. https://revistapublicando.org/revista/index.php/crv/article/view/623

Margalef, L., & Arenas, A. (2006). ¿Qué entendemos por innovación educativa? A propósito del desarrollo curricular. *Perspectiva Educacional*, *Formación de Profesores, 47*, 13-31.

Mazón, J., Martínez, J., & Martínez, A. (2009). La evaluación de la función docente mediante la opinión del estudiante. Un nuevo instrumento para nuevas dimensiones: COED. *Revista de la Educación Superior*, *38*(149), 113-139.

Mata, A., & Acevedo, A. (2010). La actitud de los profesores hacia el uso de las tecnologías de la información y comunicación. *Investigación y Postgrado*, *25*(2-3), 22-42. https://revistas.upel.edu.ve/index.php/revinpost/article/view/1408

Mayorga, R., & Pascual, J. (2019). Innovación educativa y producción de identidades: el caso del Programa Interdisciplinario de Investigación Escolar. *Educação e Pesquisa*, *45*, 1-19. https://doi.org/10.1590/s1678-4634201945194287

Mendoza, A. (2019). Ciencia, tecnología e innovación: concepciones del profesorado en el Salvador. *Revista Panamericana de Pedagogía*, (27), 75-98. https://doi.org/10.21555/rpp.v0i27.1677

Meneses, G. (2017). *Actitudes del profesorado ante la innovación curricular. El caso de la universidad de Tarapacá* (Tesis doctoral, Universidad Autónoma de Barcelona). https://84.88.27.106/handle/10803/457959

Morales, P. (2010). Investigación e innovación educativa. *Revista Iberoamericana sobre Calidad, Eficacia y Cambio en Educación*, *8*(2), 47 – 73. https://hdl.handle.net/11537/25201

Nikolaevna, N. (2019). Major factors of teachers' resistance to innovations. *Ensaio: Avaliação e Políticas Públicas em Educação*, *27*(104), 1- 21. https://doi.org/10.1590/S0104-40362019002701807

Núñez, J., López, D., Ordoñez, I., & Cortez, A. (2020). Innovación tecnológica: formación del estudiante de educación en línea. *Revista Dilemas Contemporáneos: Educación, Política y Valores*, (Número Especial). https://doi.org/10.46377/dilemas.v35i1.2236

Otzen, T., & Manterola, C. (2017). Técnica de muestreo sobre una población a estudio. *International Journal of Morphology*, *35*(1), 227-232. https://doi.org/10.4067/S0717-95022017000100037

Pascual, J. (2019). Innovación Educativa: Un proceso construido sobre relaciones de poder. *Revista Educación, Política y Sociedad*, *4*(2), 9-30. https://revistas.uam.es/reps/article/view/12205

Pérez, R. (2019). Percepciones actitudinales hacia la competencia digital docente del profesorado universitario formador de maestros en Rep. Dominicana. *Aula*, *25*, 223-239. https://doi.org/10.14201/aula201925223239

Poblete-Valderrama, F., Linzmayer, L., García, M., & Pérez, J. (2018). Percepción de futuros profesores de educación física hacia sus formadores. *Infancia, Educación y Aprendizaje* (IEYA), *4*(2), 153-157. https://ieya.uv.cl/index.php/IEYA/article/viewFile/655/1430

Ríos, D. (2004). Rasgos de personalidad de profesores innovadores: autonomía, persistencia y orden. *Revista Latinoamericana de Estudios Educativos*, *34*(2), 95-112. https://rlee.ibero.mx/index.php/rlee/issue/view/142/RLEE.XXXIV.2

Ríos, D. (2009). Características personales y profesionales de profesores innovadores. *Revista Latinoamericana de Estudios Educativos*, *39*(1-2), 153-169. https://rlee.ibero.mx/index.php/rlee/article/view/428

Rivas, L. (2019). Estrategia didáctica para el desarrollo del aprendizaje autónomo en estudiantes de la carrera de Derecho. *Horizontes. Revista de Investigación en Ciencias de la Educación*, *3*(10), 134-143. https://doi.org/10.33996/revistahorizontes.v3i10.74

Rocha, R. (2013). Escala de Opinión de los Estudiantes sobre la Efectividad de la Docencia (EOEED) en Educación Superior. *Formación universitaria*, *6*(6), 13-22. https://doi.org/10.4067/S0718-50062013000600003

Rodríguez, J. (2014). Los recursos TIC favorecedores de estrategias de aprendizaje autónomo: el estudiante autónomo y autorregulado. *Ensayos*, *5*(2), 233-251. https://revistas.uladech.edu.pe/index.php/increscendo/article/viewFile/403/308

Sáez, J. (2010). Actitudes de los docentes respecto a las TIC, a partir del desarrollo de una práctica reflexiva. *Escuela Abierta*, (13), 37-54. http://hdl.handle.net/10637/6928

Sancho, J., Ornellas, A., Sánchez, J., Alonso, C., & Bosco, A. (2008). La formación del profesorado en el uso educativo de las TIC: una aproximación desde la política educativa. *Revista Praxis Educativa*, *12*(12), 10-22. https://cerac.unlpam.edu.ar/index.php/praxis/article/view/421

Sepúlveda, A., Davis, O., Sáez, D., & Burgos, J. (2019). Percepción de los estudiantes de enseñanza media sobre su proceso de formación y las relaciones interpersonales que existen en su desarrollo escolar. *Voces de la Educación*, *4*(8), 154-176. https://www.revista.vocesdelaeducacion.com.mx/index.php/voces/article/view/109

Serdyukov, P. (2017). Innovation in education: what works, what doesn't, and what to do about it? *Journal of Research in Innovative Teaching & Learning*, *10*(1), 4-33. https://doi.org/10.1108/JRIT-10-2016-0007

Tabera, M., Álvarez, M., Hernando, A., & Rubio, M. (2015). Percepción de los estudiantes universitarios de Ciencias de la Salud sobre las actitudes de los docentes y su influencia en el clima de aprendizaje. *Revista Complutense de Educación*, *26*(2), 275-293. https://doi.org/10.5209/rev_RCED.2015.v26.n2.43028

Traver-Martí, J., & Fernández-Berrueco, R. (2016). Construcción y validación de un cuestionario de actitudes hacia la innovación educativa en la universidad. *Perfiles Educativos*, *38*(151), 86-103. https://doi.org/10.22201/iisue.24486167e.2016.151.54917

Trimmer, K., Donovan, J., & Flegg, N. (2020). Educational Innovation: Challenges of Conducting and Applying Research in Schools. In J. Donovan, K. Trimmer, & N. Flegg (Eds.), *Curriculum, Schooling and Applied Research* (pp. 1-17). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-48822-2_1

Tello, J., & Tello, L. (2013). Percepción de los estudiantes del desempeño docente en la región Junín. *Horizontes de la Ciencia*, *3*(4), 89-96. https://revistas.uncp.edu.pe/index.php/horizontedelaciencia/article/view/184

Vargas, F. (2016). Trabajo, competencias e implicaciones para la formación profesional. In K. Fukushi, S. Sánchez, & S. Vial (Coords.), *La educación Técnico profesional al servicio de Chile: rol y responsabilidad social* (pp. 223-240). Fundación Santillana.

Vásquez-Cano, E., Sevillano, M., & De Pedro, F. (2019). Análisis de propuestas de innovación educativa en el prácticum del grado en pedagogía. *Contextos Educativos*, (23), 11-29. https://doi.org/10.18172/con.3555

Yuste, B. (2015). Las nuevas formas de consumir información de los jóvenes. *Revista de Estudios de Juventud*, (108), 179-191. http://www.injuve.es/sites/default/files/2017/46/publicaciones/revista108_14-nuevas-formas-consumir-informacion.pdf

Zabalza, M. A. (2003-2004). Innovación en la enseñanza universitaria. *Contextos Educativos*, (6), 113 – 136. https://doi.org/10.18172/con.531

Zacharoula, L. (2020). Education management and the impact of innovation. *Central and Eastern European Online Library*, (2), 183-196. https://www.ceeol.com/search/article-detail?id=911156

Zavala-Guirado, M., González-Castro, I., & Vázquez-García, M. (2020). Modelo de innovación educativa según las experiencias de docentes y estudiantes universitarios. *RIDE. Revista Iberoamericana para la Investigación y el Desarrollo Educativo, 10*(20). https://doi.org/10.23913/ride.v10i20.590