Eurasian Journal of Educational Research 100 (2022) 104-118

Eurasian Journal of Educational Research
www.ejer.com.tr

Technological Social Responsibility in University Professors

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ARTICLE INFO

Article History:
Received: 12 April 2022
Received in revised form: 13 June 2022
Accepted: 10 October 2022
DOI: 10.14689/ejer.2022.100.008

Keywords
Economic dimension, social dimension, environmental dimension, technological social responsibility, and educational institutions.

ABSTRACT

Purpose: This study examines the relationship between the economic, social, and environmental dimensions of social responsibility and the level of knowledge regarding technology social responsibility among Peruvian university professors. This study assessed the technical and social responsibility knowledge level among Peru's public and private university instructors**. Design/methodology/approach** This study was conducted using a quantitative research approach and a cross-sectional research design utilizing a survey questionnaire to acquire primary data. This study's sample comprised 1,159 public and private university professors in Peru. The academics of Peru's public and private institutions contribute to data collection. 280 valid questionnaires were utilized for data analysis with Partial Least Square (PLS). **Findings** According to the study, the economic, social, and environmental dimensions of social responsibility favor Peruvian university teachers' awareness of technology and social responsibility. In addition, it is discovered that there is a considerable knowledge gap between public and private university teachers regarding technology and social responsibility. **Practical implications** This study's findings help resolve concerns about low levels of knowledge among Peru's public and private colleges, which may contribute to the promotion of technological social responsibility among institutions. **Originality/value** Prior studies in the literature examined technology social responsibility, but professors' knowledge is not included. In Peru, comparative research between professors of public and private colleges has not been conducted in the past.

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1. Introduction

In the current era of the fourth industrial revaluation (Moktadir et al., 2018; Raj et al., 2020), technology is expanding rapidly in all spheres of society, and it dominates the educational system. Currently, all educational institutions and various other organizations depend on technology. The incorporation of modern technologies into academic training improves efficacy and productivity. Moreover, technology is integral to social responsibility actions in this technological age. The use of technology makes activities simpler and less resource-intensive. With the aid of cutting-edge technology, businesses are completing a variety of tasks. Therefore, the concept of technological social responsibility is expanding rapidly (Alleluyanatha & Treasure, 2021).

Technological social responsibility entails an intelligent connection between the short- and medium-term objectives of institutions and the longer-term objectives of the society. The institutions modeled how technology adoption could play out in today's economy using existing ideas of welfare economics as a foundation and improving upon them (Gao, Harrison, & Tchernis, 2022). Consequently, social responsibility is the connection between institutional objectives and the long-term benefit of society. Technology expands the scope of social responsibility and simplifies the associated activities. Therefore, technology necessitates the development of an expanded sense of responsibility. This notion of technology social responsibility is gaining traction in educational institutions, where instructors focus on promoting social responsibility.

However, the level of awareness (Carlini & Grace, 2021) about technology social responsibility among public and private university academics in Peru is insufficient (Carlini & Grace, 2021). Peruvian university instructors must have adequate knowledge to encourage technology social responsibility. Using the economic, social, and environmental components of social responsibility can impact the degree of expertise. Therefore, this study aimed to investigate the influence of the economic, social, and environmental dimensions on the degree of knowledge among public and private university instructors. There may be significant differences in the level of expertise between public and private university teachers, a factor that the current study also considers (Boni et al., 2021).

Consequently, this study investigates the relationship between the economic, social, and environmental dimensions of social responsibility and the level of knowledge regarding technological social responsibility among university teachers in Peru. In addition, this study assessed the level of technical and social responsibility knowledge among public and private university instructors in Peru. The quality of teachers' expertise can measure the contribution of these public and private colleges to social responsibility. Previous research in the literature has also addressed technology social responsibility; however, academics' expertise is not addressed. Specifically, the previous studies have not compared teachers at Peru's state universities to those at private universities.

2. Literature Review

The notion of technological social responsibility refers to examining, in addition to the attributes of a specific technology product or service, its impact on citizens as individuals

or groups (Yoon, Gürhan-Canli, & Schwarz, 2006). The application of one technology or another, as well as how technology-based services are planned and employed for the user. The distinction resides in that while technical social responsibility must be considered in both the public and private spheres, the consequences are distinct. Depending on the environment, they may be more or less severe.

Higher education is a topic of constant awareness and discussion, particularly about the information technology revolution and the concurrent expansion of internationally competitive, knowledge-based economies. This is especially true when thinking about the future of higher education (Mazur-Wierzbicka, 2021). On this topic, there is a growing body of contemporary writing, some of which can be found in the following locations: A collection of research supported by the National Academies of Science, Engineering, and Medicine of the United States, A website resulting from a visioning process sponsored by the Carnegie Foundation, the Centre for Educational Research and Innovation, and a collection of thought-provoking literature (Velásquez-Hoque, 2021). Suppose only classical variables, such as maximizing profit while minimizing costs, are considered. In that case, it is easy to overlook the organization's ethics, its social role, which extends beyond producing economic benefits, and its reputation in the environment and the social ecosystems in which it coexists (Guadamillas-Gómez & Donate-Manzanares, 2011).

In this respect, the current study aimed to assess the level of knowledge among public and private university instructors about the technology element of social responsibility. Consideration is given to three aspects of social responsibility: the economic dimension, the social dimension, and the environmental dimension. Knowledge of technological social responsibility's economic, social, and environmental components can vary across public and private university teachers. Figure 1 illustrates the relationship between the economic, social, and environmental dimensions and the amount of knowledge (Hauser et al., 2022).

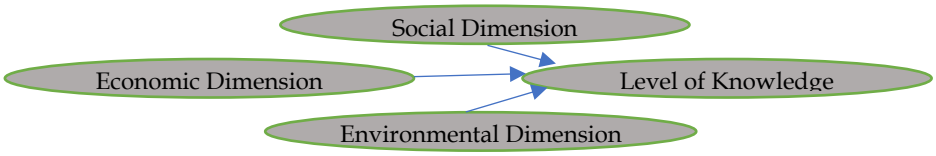

Figure 1. *The relationship of the economic dimension, social dimension, and environmental dimension with the level of knowledge*

2.1 Hypotheses Development

Social responsibility is an ethical theory in which individuals are accountable for their civic duties, and their activities must benefit society. It is a vital activity that contributes to the welfare of society (Narayanan & Singh, 2022). Social responsibility is a critical activity that ensures the equilibrium between economic growth, the welfare of society, and an extraordinary environmental impact. Every institution engages in this activity because it belongs to every institution. The institution could be an educational institution or a corporation. Ethical responsibility is regarded as the most critical aspect of commercial organizations. As it is the responsibility of business organizations to protect the

environment (Sisaye, 2021) and engage in a variety of other activities that contribute to the welfare of society, businesses must engage in these endeavors.

Social responsibility is not exclusive to corporate enterprises; it also ties to educational institutions (Gilal et al., 2019; Rasoolimanesh et al., 2021). The idea of social responsibility is currently on the rise in educational institutions and businesses because any organization serving society has several responsibilities relating to that society. Similarly, educational institutions working in a particular sector have social obligations that contribute to improving society's welfare. In addition, it is tied not just to institutions but also individuals. Every member of society has a personal obligation to safeguard the community through various acts. It is crucial because the welfare of society cannot be achieved with the assistance of a single individual or institution. It is one of the collective efforts made by institutions and individuals in a particular society. The prevalence of social responsibility practices among enterprises and individuals is soaring. The current study examined the social responsibility behaviors of educational institutions' members.

In equational institutions, teachers' attitudes about social responsibility are increasing significantly. Initially, the concept of social responsibility existed at a low level, but it is expanding and bringing significant societal advantages. Notably, the social duty of teachers in higher education institutions is growing. University academics participate in a variety of activities that serve the public. These activities mainly involve environmental, economic, and social welfare. All of these activities contribute significantly to society (Makoi, 2020). In addition to the involvement of corporate groups, higher education institutions are implementing different approaches to protect the environment (Gilal et al., 2019; Salinas & Lozano, 2019). Universities and numerous other organizations are delivering significant benefits to society through improved environmental performance, beneficial economic activities for the people, and several other social benefits. Particularly in Peru, these activities are expanding, substantially benefiting various stakeholders. Environmental conservation efforts among professors of Peruvian institutions are growing alongside other activities that generate income for the populace. Higher education institutions provide several options to generate cash for the populace. The technological social responsibility of corporations is expanding today. To get optimum benefits, however, it is necessary to attain a suitable degree of technical and social responsibility knowledge.

However, the importance of technology social responsibility knowledge levels cannot be overstated. As this paradigm emerges in educational institutions, the level of knowledge is at an all-time low. A greater level of expertise is required to maximize the benefits of technologically-related social responsibility. Here, the most significant position among universities is that of academics, who can play the most influential role. Institutional education regarding social responsibility is essential for the development of the concept. Professors' levels of knowledge play a crucial role in initiating collaboration between educational institutions and society through activities that benefit communities and universities considerably. However, the degree of expertise (Bibi et al., 2022; Carlini & Grace, 2021; Koch et al., 2019) may differ between public and private colleges in Peru (Bibi et al., 2022; Carlini & Grace, 2021; Koch, Bekmeier-Feuerhahn, Bogel, & Adam, Given the significance of the level

of knowledge associated with technology social responsibility, the knowledge judgments of academics at public and private colleges are significant. More excellent knowledge may result in greater social, economic, and environmental responsibility, which offers long-term advantages for society. Considering the significance of knowledge level, the current study compared the knowledge levels of university professors regarding the technical dimensions of social responsibility.

In the present study, social responsibility is examined in connection to three dimensions: economic, social, and environmental. All of these factors are equally important to society. Economic responsibility is the moral obligation of an entity to support all of its financial decisions in the execution of its numerous responsibilities. The ultimate goal is to improve the profit margin and ensure that all corporate operations benefit the environment, people, and society. The economic duties of the institutions are also contingent on the well-being of the institutions' personnel. Most important is the promotion of various activities that improve the economic status of employees. In addition, institutions' most significant financial obligation is to create lucrative income-generating opportunities in a specific geographic region where companies conduct business. The creation of varied income-generating opportunities can contribute to the well-being of society as a whole. Similar to business organizations, educational institutions, particularly universities, can play a crucial role (Jarmusevica, 2019; Rahman, Castka, & Love, 2019; Scavarda et al., 2019), with professors playing a crucial role in initiating these concepts. However, understanding technology's social responsibility from an economic perspective is vital.

Professors at public and private colleges may have varying levels of economic understanding. Therefore, the current study examined the financial component's impact on professors' knowledge levels. In addition, the social aspect is of equal importance. The social dimension is based on the organizations' social actions for the benefit of the people. These activities are essential to the residents of a specific region (Amani, 2022). The groups engaged in this field can contribute to the resolution of people's many social concerns.

Similarly, educational institutions can play a more significant role in addressing societal issues. However, awareness of the social technology dimension is essential for promoting various social activities. Lastly, the environmental aspect of social responsibility is critical to society (Sebrina et al., 2023). Environmental and social responsibility refers to an institution's commitment to participate in sustainable economic development to improve the quality of life and environment, which will benefit the institution, the local community, and society. It is one of the institutions' most significant social obligations, as environmental conservation is crucial. The environment directly impacts people's health (Hunter et al., 2019). Therefore, environmental performance is of the utmost importance to preserve. Achieving a specific degree of environmental performance is essential for a substantial level of life quality in society. The actions of the institution must not hurt the environment. Institutional operations must protect the environment through various measures.

However, as indicated previously, university teachers must possess a significant understanding of the technological aspect of social responsibility. There may be a difference in the level of knowledge between public and private university instructors. Consequently, based on the preceding discussion, the present study offered the following hypotheses:

Hypothesis 1. *The economic dimension relates to the level of knowledge about technological social responsibility in Peruvian university professors.*
Hypothesis 2. *The social dimension relates to the level of knowledge about technological social responsibility in Peruvian university professors.*
Hypothesis 3. *The environmental dimension relates to the level of knowledge about technological social responsibility in Peruvian university professors.*
Hypothesis 4. *There is a significant difference in the level of knowledge related to technological social responsibility among Peruvian public and private university professors.*

3. Research Methodology

This study examined quantitative research methodology. This quantitative study analyzed 1,159 teachers from public and private colleges in Peru across all faculties. 548 academics from three public universities and 611 professors from three private universities made up this population. An online survey was conducted to collect data. From university websites, the email addresses of academics were acquired, and questionnaires were disseminated via email. In addition, data obtained via Google forms were considered in this research.

The data-gathering instrument was created based on previous research. After the questionnaire was created, it was distributed to specialists in the same field. Consequently, face validity and content validity were assured with the assistance of experts from several colleges. Before data collection, the questionnaires were evaluated by three specialists, and any suggested modifications were implemented. The experts proposed minor changes to the variable scale goods. The questionnaires were separated into two primary components, comprising the demographic profile of respondents and scale items about the critical factors of the study, including economic dimension, social dimension, environmental dimension, and degree of knowledge. The research was conducted in partnership with the administration of each educational institution, which also permitted survey participation. Before data collection, the purpose of the study was assessed because it was vital to offer each participant complete information. Participants' names, occupations, and other identifying information were deleted from the survey.

Using five scale items, the economic dimension was measured. In addition, the social dimension was assessed using five scale questions. Similarly, five scale items were used to quantify the environmental factor. The knowledge level of the dependent variable was tested using four scale items. Incomplete questionnaires were deleted from the survey after data collection, and only valid questionnaires were used for data analysis. In addition, Partial Least Square (PLS) was employed for data analysis in which the measurement and structural models were investigated.

4. Findings

The number of scale items, missing values, outliers in the data as measured by maximum and lowest values, and the normality of the data is displayed in Table 1. These data statistics are shown following data screening (Won, Wan, & Sharif, 2017). A data screening was performed to identify outliers and missing values. The results of the data screening revealed that the data is devoid of outliers and missing values. In addition, the current study investigated the data's normalcy.

Table 1

Data Satisfices

	No.	Missing	Mean	Median	Min	Max	SD	Kurtosis	Skewness
ED1	1	0	5.934	6	2	7	0.903	3.219	-1.398
ED2	2	0	5.685	6	2	7	1.046	1.608	-1.251
ED3	3	0	5.725	6	2	7	0.869	2.266	-1.184
ED4	4	0	5.308	6	2	7	1.158	0.024	-0.664
ED5	5	0	5.484	6	1	7	1.202	0.975	-1.012
SD1	6	0	5.363	6	1	7	1.194	0.906	-0.99
SD2	7	0	5.707	6	1	7	0.962	2.865	-1.197
SD3	8	0	5.557	6	1	7	1.082	2.32	-1.265
SD4	9	0	5.341	6	2	7	1.075	0.77	-0.837
SD5	10	0	5.615	6	2	7	0.915	1.67	-0.95
END1	11	0	5.678	6	1	7	0.949	3.075	-1.18
END2	12	0	5.465	6	2	7	0.991	1.414	-1.062
END3	13	0	5.799	6	2	7	0.873	2.752	-1.159
END4	14	0	5.637	6	1	7	0.959	3.914	-1.373
END5	15	0	5.234	5	1	7	1.184	0.707	-0.875
LK1	16	0	5.3	5	1	7	1.131	1.551	-0.978
LK2	17	0	6.073	6	2	7	0.966	3.28	-1.498
LK3	18	0	6.055	6	2	7	0.839	1.531	-0.927
LK4	19	0	6.033	6	3	7	0.903	1.114	-0.995

Note: LK = Level of Knowledge; ED = Economic Dimension; SD = Social Dimension; EDN Environmental Dimension

4.1 Partial Least Square-Structural Equation Modeling (PLS-SEM)

The relationship between variables is examined using Partial Least Square-Structural Equation Modeling (PLS-SEM). PLS-SEM is essential for exploring the relationship of a model based on primary data (Barroso, Carrión, & Roldán, 2010; Henseler & Fassott, 2010; Ismayana & Adeleke, 2020); thus, it is analyzed to determine the effect of independent variables on the dependent variable. Figure 2 depicts the PLS measurement model, which indicates the factor loadings of the scale components. According to Table 2, all of the scale items have factor loadings greater than 0.5. Consequently, the internal item reliability is realized.

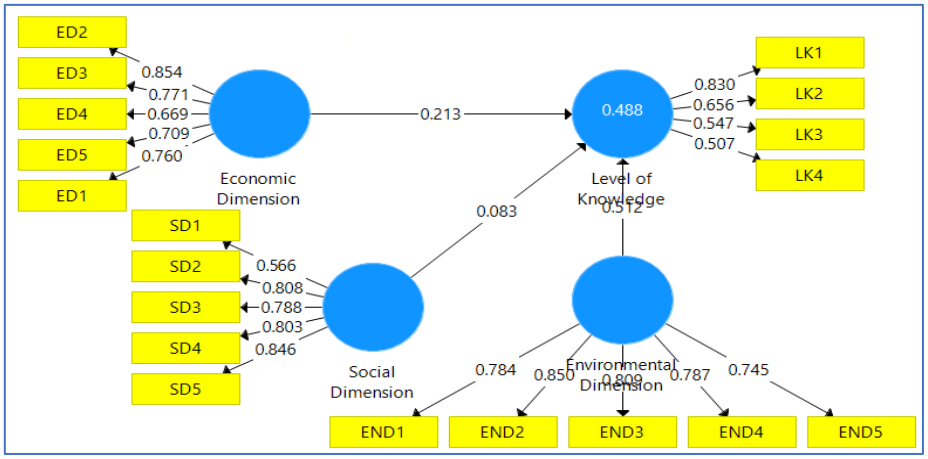

Figure 2. *Measurement Model*

Note: LK = Level of Knowledge; ED = Economic Dimension; SD = Social Dimension; EDN Environmental Dimension

Table 2

Convergent Validity

Variables	Items	Loadings	Alpha	CR	AVE
Economic Dimension	ED1	0.76	0.813	0.868	0.571
	ED2	0.854			
	ED3	0.771			
	ED4	0.669			
	ED5	0.709			
Environmental Dimension	END1	0.784	855	0.896	0.633
	END2	0.85			
	END3	0.809			
	END4	0.787			
	END5	0.745			
Level of Knowledge	LK1	0.83	0.7	0.711	0.394
	LK2	0.656			
	LK3	0.547			
	LK4	0.507			
Social Dimension	SD1	0.566	0.798	0.865	0.57
	SD2	0.808			
	SD3	0.788			
	SD4	0.803			
	SD5	0.846			

Note: LK = Level of Knowledge; ED = Economic Dimension; SD = Social Dimension; EDN Environmental Dimension

Composite reliability and Cronbach alpha are considered while evaluating the dependability of constructs. Table 2 indicates that the composite reliability and Cronbach alpha values are more than 0.70. Because the average variance extracted (AVE) is more than 0.5 for all constructs, all constructs are reliable and convergent validity is attained. In addition, discriminant validity is reported using heterotrait-monotrait correlation ratios (HTMT) with a maximum threshold of 0.90. All values in Table 3 are less than 0.9.

Table 3

Discriminant Validity

	Economic Dimension	Environmental Dimension	Level of Knowledge	Social Dimension
Economic Dimension				
Environmental Dimension	0.484			
Level of Knowledge	0.644	0.647		
Social Dimension	0.613	0.839	0.61	

PLS bootstrapping is used to examine the relationship between variables (Hair et al., 2017; Hair et al., 2012; Hair Jr et al., 2016), where the t-value was 1.96, and the beta value was considered. A relationship with a t-value greater than 1.96 was deemed supported, while a relationship with a t-value less than 1.96 was considered unsupported. Figure 3 illustrates PLS bootstrapping. Table 4 contains a listing of the hypothesis' results. The results show a substantial association between the economic dimension and the amount of knowledge, supporting hypothesis 1. The significant association between social extent and the amount of knowledge supports hypothesis 2. In addition, the association between an environmental factor and knowledge level is substantial, supporting hypothesis 3. Additionally, importance is evaluated using a minimum and maximum limit.

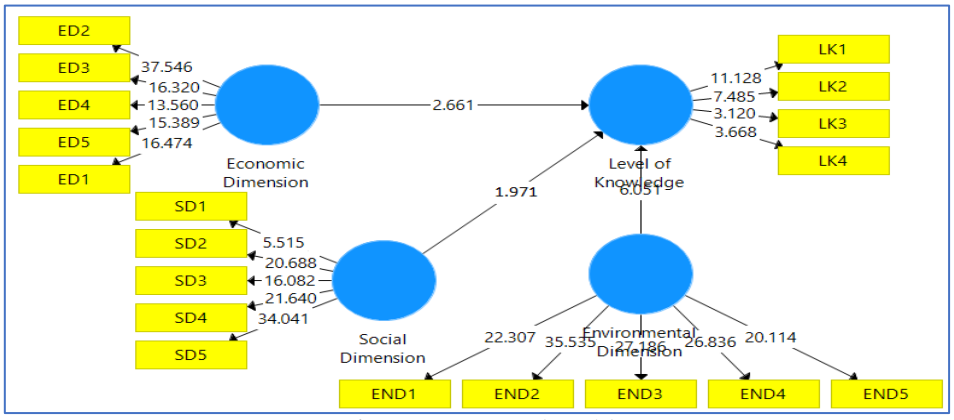

Figure 3. *Structural Model*

Note: LK = Level of Knowledge; ED = Economic Dimension; SD = Social Dimension; EDN Environmental Dimension

Table 4

Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Economic Dimension -> Level of Knowledge	0.213	0.217	0.08	2.661	0.008
Environmental Dimension -> Level of Knowledge	0.512	0.515	0.085	6.051	0
Social Dimension -> Level of Knowledge	0.083	0.082	0.042	1.971	0.048
	Original Sample (O)	**Sample Mean (M)**	**Lower Limit**	**Upper Limit**	
Economic Dimension -> Level of Knowledge	0.213	0.217	0.066	0.387	
Environmental Dimension -> Level of Knowledge	0.512	0.515	0.342	0.671	
Social Dimension -> Level of Knowledge	0.083	0.082	0.122	0.259	

4.1.1 Multigroup Analysis

Using multigroup analysis, the variance in the level of technology social responsibility knowledge among university professors in Peru. The PLS-based multigroup analysis is best for comparison (Cheah et al., 2020; Suh et al., 2023). The findings of the multigroup analysis are shown in Table 5. Two sets of data regarding teachers at public and private universities in Peru are considered.

As shown by multigroup analysis, private and public university professors differ significantly in terms of the relationship between economic dimension and level of knowledge regarding technical social responsibility. Moreover, there are considerable differences between private and public university teachers regarding the relationship between social size and level of expertise regarding technological and social responsibility. However, there is no substantial difference between private and public university professors regarding the association between the environmental dimension, technical, and social responsibility knowledge level. The observation is made using p-value statistics. The p-value for the association between environmental dimension, technical, and social responsibility knowledge level among private and public university professors is more significant than 0.05 ($P > 0.05$; p-value = 0.068). In the remaining two instances, the p-value is less than 0.05, indicating a significant difference.

Table 5

Multi Group Analysis Results

	Difference (Public University-Private University)	2-tailed (Public University vs. Private University) p-value
Economic Dimension -> Level of Knowledge	0.321	0.001
Social Dimension -> Level of Knowledge	0.054	0.042
Environmental Dimension -> Level of Knowledge	0.255	0.068

In addition, the data demonstrated that private university instructors have a greater understanding of technology and social responsibility. The data indicate that public university teachers have a 25% lower degree of knowledge than personal university academics. Professors at private universities have a 23% higher level of expertise than professors at public universities, who have a 4% higher degree of knowledge. Table 6 summarizes these results.

Table 6

Level of knowledge about the technological social responsibility of professors

	Public universities		Private Universities	
	F1	%	F1	%
Null	38	3%	19	2%
Low	284	25%	113	10%
Regular	175	15%	214	18%
High	51	4%	265	23%
Total	548	47%	611	53%

5. Discussion

This study sought to examine the relationship between the economic, social, and environmental dimensions of social responsibility and the level of knowledge regarding technology social responsibility among Peruvian university professors. In addition, this study assessed the level of technical and social responsibility knowledge across public and private university instructors in Peru. The survey questionnaire was used to collect primary data, which was then analyzed using the statistical tool.

According to the study's findings, the economic dimension favors the degree of knowledge. Professors at both public and private colleges can have a greater understanding of technology and social responsibility if their financial expertise expands. These results are based on hypothesis 1, which is supported by these findings. Malaquias, Malaquias, and Hwang (2016) emphasized the technological significance of information for social responsibility. Therefore, economic responsibility knowledge can encourage technical and social responsibility.

In addition, the social component is a significant factor that influences the level of knowledge of public and private university instructors. Knowledge regarding the social dimension of social responsibility can be used to promote an understanding of technical, social responsibility. The integration of technology with social responsibility is crucial for advancing social responsibility. As the association between social dimension and technical, social responsibility knowledge level is considerable, this supports hypothesis 2. The significance of the relationship between environmental factors and the amount of knowledge was examined in the third hypothesis. Environmental knowledge can increase understanding among public and private university instructors. Lastly, hypothesis 4 is likewise significant, confirming the difference in teachers' levels of understanding between public and private universities. Private university instructors have a higher knowledge level than their public university counterparts. Therefore, private university professors' technical and social responsibility knowledge is superior to public university professors, whose degrees of understanding must be increased.

6. Conclusion

The economic, social, and environmental dimensions of social responsibility can be utilized to increase the understanding of technology social responsibility. The technical responsibility techniques can aid in fostering an innovative and technology-driven environment while maintaining social responsibility. Universities must serve as a hub for promoting training, research and development initiatives, social awareness, and support for programs that further their fundamental mission, which is to promote responsible and beneficial technology for society. All universities in Peru must have a connection to the environment. They must recognize that technology is a pillar of the ecological transition and other social and economic factors. Technical and social responsibility must be considered an obligation to all parties impacted by technological activity. The ethical and social components developed due to new technologies and achievements shortly should be maintained purposefully at universities.

7. Implications of the Study

This study examined the influence of the economic, social, and environmental dimensions on university teachers' level of knowledge. This is a novel association that was overlooked by earlier research. In the literature, the level of technical and social responsibility understanding is relatively uncommon, which has significant ramifications. This study compared the knowledge levels of public university professors and private university academics. This study provides practitioners with critical considerations for enhancing technology social responsibility with the assistance of university instructors' levels of expertise. Focusing on the economic, social, and environmental dimensions helps increase understanding of technology's social responsibility. Because public university professors in Peru have a lower level of knowledge than private university professors, greater emphasis should be placed on enhancing professors' degrees of knowledge about technological social responsibility.

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