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Classification of Student Leadership Profiles in Diverse Governance Settings: Insights From Pisa 2022

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Abstract: Student leadership prepares students for responsibilities such as taking on specific tasks, assuming leadership roles in their future personal and professional lives. Developing students' leadership profiles is among the important goals of educational systems aiming for future generations to take responsibility and advance their countries. With this perspective in mind, the PISA assessment includes items to measure students' leadership behaviors. This study aims to extract student leadership profiles from the leadership-related items in the PISA 2022 application, using data from Cambodia, Peru, Paraguay, and Guatemala, which have different governance systems and cultural characteristics. The second purpose of the research is to determine the distribution of the identified leadership profiles in these countries and explain them in the context of governance and cultural characteristics. Latent class analysis was used to determine student leadership profiles. Accordingly, 2-class and 3-class latent models were found to be the most suitable models to explain student profiles. While the distinction between student profiles is more pronounced in the 2-class model, the 3-class model provides more detailed information about student profiles. In this respect, 2-class and 3-class latent models are reported comparatively. In the 2-class latent model, students are labeled as the "Shy or Lack of Self-Confidence Group" and the "Active Leader or Influential Group." In the 3-class latent model, students are labeled as the "Moderate or Passive Leader Group," the "Strong Leader or Influential Group," and the "Avoidant or Leadership-Uncomfortable Group." In both models, it is one of the striking findings that Cambodian students are in the low leadership profile, and Peruvian students are in the high leadership profile.

Keywords: student leadership; students' leadership characteristics; latent class models

1. Introduction

There is no consensus on the definition and purpose of student leadership, as well as how it should be encouraged and labeled. However, in the literature, expressions such as participation, active citizenship, democratic school, and giving students a voice are used in relation to student leadership (Black et al., 2014). In this context, it can be said that student leadership should be taught to all students with a sense of social responsibility (Gott et al., 2019). In this teaching process, learning leadership and developing leadership skills may require different learning methodologies than learning other subjects in a normal classroom environment, as it is different (Eich, 2008; Jenkins, 2013; Wren, 1995). In this context, according to Seemiller (2016), students' leadership competencies can be developed in two ways: through an on-the-job learning approach they learn through experience and a more intentional and developmental approach involving education, teaching, coaching, and feedback. In addition, implicit learning such as public awareness campaigns, political campaigns, informal learning, and socialization are also needed for the development of students' leadership skills (Hoffman et al., 2008).

The values, thoughts and behaviors that form the essence of leadership are social and interactive processes; therefore, they are culturally influenced. This fact causes leadership to be approached from different perspectives depending on cultural differences. For example; while leadership in Western

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societies is seen as based on a set of technical skills, in Chinese society leadership is more seen as a process of influencing relationships and modeling desired behaviors (Dimmock and Walker, 2005). There are many studies in the literature showing that leadership understanding differs in different cultures (Dorfman et al., 1997; Dwairy, 2019; Euwema, 2007; Jogulu, 2010; Shahin & Wright, 2004; Taleghani et al., 2010; Wang et al., 2012).

Based on the research on the leadership-culture axis, it can be argued that the leadership profiles of students continuing their education in different cultures may also differ. Furthermore, the implementation of a school-centered management strategy, known as democratization, has been found to have beneficial impacts on leadership (Pont et al., 2008). inside this particular framework, it is posited that the augmentation of democratization levels inside nations could potentially impact the leadership characteristics of individuals, particularly students, residing within said country. The results of some globally applied exams can be used to test the reality of this claim. PISA, TIMSS, PIRLS, TALIS are among the exams applied globally (Gümüş et al., 2024; Nilsen & Teig, 2022; Sampaio Maia et al., 2022; Teig, 2022). PISA has emerged as a valid and reliable criterion for evaluating student performance, providing comparative data on educational outcomes among participating countries. It has gained significant influence on education policy and decision-making processes worldwide (AlKaabi et al., 2022). In the literature, there are studies focusing on the relation of PISA to countries' education policies (Araujo et al., 2017; Białecki et al., 2017; Carvalho et al., 2017; Dobbins & Martens, 2012; Niemann et al., 2017; Rautalin et al., 2019; Schleicher & Zoido, 2016; Sellar & Lingard, 2013; Tasaki, 2017; Waldow, 2009; Zoido, 2016) and students' competencies in certain areas (reading, scientific literacy, mathematical literacy, inquiry skill, financial literacy, etc.) (Amir et al., 2023; Hopfenbeck & Kjærnsli, 2016; Lavonen & Laaksonen, 2009; Jerrim et al., 2022; Jerrim & Moss, 2019; Stacey, 2011; Sadler & Zeidler, 2009; Teig et al., 2020; Zhang & Liu, 2016). However, no research examining the data on students' leadership profiles included in PISA has been encountered. In this context, in our research, it will be examined whether there is a difference in the leadership profiles of students living in different countries, based on PISA results. For this, first, the reflections of the relationship between leadership and culture on individuals are discussed.

2. Reflections of the Relationship Between Leadership and Culture on Individuals

Although globalization has led to the convergence of many intercultural activities, cultural differences persist (Bayraktar et al., 2022). Societal culture has a major influence on the emergence of these differences. Societal culture imposes certain assumptions, ideas, traditions, and attitudes on the people living in that society, affecting their perceptions of reality and their behaviors within reality (Hofstede, 2001). In this way, societal culture shapes acceptable and unacceptable behaviors in a given situation. At the same time, societal culture limits the leadership behaviors and characteristics accepted in that culture (Resick et al., 2011). Summarizing the situation, Bass (1997) states that organizational and cultural factors influence the concept of leadership. Additionally, according to research, managers' leadership styles and organizational work practices differ depending on the cultures in which they are applied and have various consequences on employee work outcomes (Eisenberg et al., 2015; Fischer et al., 2014; Hong et al., 2016; Jogulu, 2010; Lok & Crawford, 2004).

The assumptions of Role Theory, defined by Biddle (1979) as "a science concerned with the study of the characteristic behaviours of people in contexts and the processes that produce, explain, or are influenced by these behaviours", can be used to demonstrate the relationship between leadership and culture. Role theory posits that expectations define roles (Polzer, 2015). According to this theory, leadership as a role is significantly influenced by certain ideals and leads to the preference of a particular leadership role in the workplace (Chong et al., 2018; Shivers-Blackwel, 2004). Additionally, Role Theory addresses the extent to which leadership behaviors are fixed or vary depending on values. The East-West dichotomy is one of the defined value categories (Oyserman et al., 2009). Based on the assumptions of Role Theory, it can be said that leaders can redefine their roles by considering culturally significant symbolic values in their behaviors (Arun and Gedik, 2020; Dorfman et al., 1997; Hayward et al., 2017; Kim & Park, 2020; Van de Vliert, 2008).

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It is an undeniable reality that there are many similarities regarding management processes of organizations in a globalized world. The literature focuses more on these common points rather than how leadership roles, behaviors, and styles can differ across different cultural or work contexts (Gutierrez et al., 2012). On the other hand, cultural fit seems to be overlooked in leadership-related theories and practices. This situation highlights a mono-cultural understanding while causing alienation, isolation, and disadvantages for indigenous and ethnic groups (Collard, 2007).

The evolution in leadership approaches also reveals the importance of culture in this regard. Accordingly, Sanchez-Runde et al. (2011) analysed contemporary approaches in the context of global leadership models under three sub-headings. These are the Universal Approach, which argues that leadership is a universal characteristic, the Normative Approach, which focuses on the characteristics and skills of global leaders, and the Contingency Approach, which rejects universal principles for effective leadership and recommends that leaders change their behaviours according to local characteristics. This approach emphasises the role of situational variables and culture as contextual factors affecting leadership. In addition, this approach considers it necessary to consider the relationship between leader behaviour and the situational environment, including cultural differences, in understanding effective leadership (Ayman et al., 2007).

At this point, the question of what should be the main issues to be considered in the leadership-culture relationship comes to mind. Miller (2017) argues that factors such as language, beliefs, values, religion and social organisations cause cultural differences in the international perspective. In addition, it is stated that the good governance of countries, in other words, the understanding of governance followed in meeting social needs and providing services, is also effective in the understanding of leadership in that country (Ahmed, 2021). In this context, it can be said that the management approaches of countries have a role in making the existence of different leadership practices more apparent. The existence in question can become dominant in the understanding of leadership as a cultural code. For example, while participatory and inclusive leadership practices are valued in a democratic management approach, organisational structures, discourses, speech and communication within the hierarchy are given great importance (Barthold et al., 2020). In addition, in such managements, responsibility is distributed among members, empowering group members and enabling them to take part in decision-making processes (Gastil, 1994; Hulpia & Devos, 2010; Quiroz-Niño & Blanco-Encomienda, 2019; Spreitzer, 2007; Woods, 2004). In addition, in environments where democratic leadership is dominant, women's leadership is supported for long-term socio-economic growth and great importance is attached to the diversification of the workforce and the empowerment of individuals (Maheshwari et al., 2021). These practices contribute to the positive development of individuals' culture of democracy and democratic leadership understanding (Bowler & Donovan, 2002; Cho, 2014; Garrison, 2003; Velarde & Ghani, 2019).

In societies where undemocratic leadership is dominant, situations such as concentration of power and authority in the hands of a few people, harsh decision-making, violation of democratic norms and principles, absolute domination of subordinates, and disregard of subordinates' contributions and suggestions are common (Adıguzel et al., 2020; Barański, 2020; Gao, 2021; Keenan & Zavala, 2021; Li & Wang, 2015; Taldykin, 2021). However, it is also seen that information manipulations are used to create a positive image instead of transparency and honesty in communication (Shan et al., 2022). In this context, absolute obedience and loyalty can be mentioned in conditions where undemocratic leadership is dominant (Sekulova et al., 2017; Woodward et al., 2008). In addition, the understanding of tolerating undemocratic behaviours is at a higher level in such environments (Frederiksen, 2022; Passini & Morselli, 2010; Simonovits et al., 2022). In addition, it is seen that women leaders face many problems in undemocratic leadership and are tried to be prevented from being in leadership positions (Rizzo et al., 2007; Stowers et al., 2019; Yadav & Fidalgo, 2021).

In addition to the theoretical context, existing studies in the literature show that culture and leadership are interrelated (Dastmalchian, 2001; Wong, 2001); management style and cultural elements affect educational outcomes (Luschei & Jeong, 2020). For example; in a study conducted in China (Bush & Haiyan, 2000), it was determined that students' leadership skills developed in the

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form of loyalty to authority, collectivism and respect for harmony. In a similar study conducted in Iran (Dastmalchian, et al., 2001), it was noted that leadership profiles are influenced by cultural factors. It is well known that leadership style or leadership perception is influenced by local and cultural elements (Oplatka & Arar, 2016). In the literature, there are many studies on school leadership (Bush & Glover, 2014; Day et al., 2020; Flessa et al., 2018) and instructional leadership (Hallinger, 2005; Horng, & Loeb, 2010). However, there is no study examining the effect of the form of government and local culture on students' leadership profiles. This has been the motivation for this study. Developing students' leadership skills helps them to become individuals who guide others correctly, take responsibility, work hard and make effective decisions in their business life or social roles in the following years (Kapur, 2019). Therefore, the leadership profiles of students are important indicators for the future of the society and the country in which they live. In addition to revealing the current situation of 15-year-old students at the international level, the PISA application also provides important information for the generation of countries that will soon be involved in business life. In this respect, the items related to leadership in the student questionnaires of the PISA 2022 application (items coded between ST305Q01JA- ST305Q10JA) are very important in terms of revealing whether students show different leadership profiles and examining whether these leadership profiles change according to the management style and cultural characteristics.

In order to examine the leadership profiles of students, the data of Guatemala, Cambodia, Peru and Paraguay of the PISA 2022 application were analysed using Latent Class Analysis (LCA). The reason why latent class analysis is preferred in examining students' leadership profiles is that it is an individual-based approach (Bergman & Wangby, 2014) and does not require assumptions such as sampling normality and homogeneity of variances (Kankaras, Vermunt & Moors, 2011). LCA is a statistical method used to identify subgroups of a large population through a set of indicators (Nylund-Gibson & Choi, 2018). In the selection of the countries included in the research sample, attention was paid to the fact that they represent different situations in terms of culture and management style variables that are expected to affect the distribution of student leadership profiles.

To summarize, the aim of this research is to examine the leadership profiles of students through the PISA 2022 data. In line with this aim, answers to the following questions are sought:

1. According to the PISA 2022 data, do students have different leadership profiles?
2. Do the leadership profiles exhibited by students vary between countries with different administrative styles and cultures?

3. Method

3.1. Sample

The PISA 2022 assessment formed the main data for this study. The analyses of the research were carried out on a total of 22,521 students from four countries, namely Guatemala, Cambodia, Paraguay, and Peru, which participated in the PISA 2022 assessment. In terms of their distribution in the sample, Guatemala accounts for 23% (5,190), Cambodia 23.4% (5,279), Paraguay 22.6% (5,084), and Peru 30.9% (6,968). A total of 81 countries from different continents of the world participated in the PISA 2022 assessment (OECD, 2023a). A two-stage sampling method was used in the sample selection for the countries participating in the PISA 2022 assessment (OECD, 2023b). Within the scope of this research, the countries of Guatemala, Cambodia, Paraguay, and Peru, which have different cultural and administrative understandings, were selected to determine the leadership profiles of students.

3.2. Data Collection Tools

The analyses of this research were carried out using the data from the student questionnaires of the PISA 2022 assessment. When examining the PISA 2022 reports, it was observed that the student questionnaires section included several items related to students' leadership characteristics (Educational Testing Service, 2021). The items included in the student questionnaires within the

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scope of the PISA 2022 assessment inquire about the students' degree of participation in relevant items that are indicators of the "leadership" characteristic. These items were graded with the options "Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), Strongly agree (5)". Detailed information about the items included in the questionnaire is shown in Table 1.

Table 1. Item codes item content and response ranges for Student Leadership Behaviour.

Item Code	Item Content	Response Range
ST305Q01JA	I am comfortable with taking the lead role in group.	1 / 2 / 3 / 4 / 5
ST305Q02JA	I know how to convince others to do what I want.	1 / 2 / 3 / 4 / 5
ST305Q03JA	I enjoy leading others.	1 / 2 / 3 / 4 / 5
ST305Q04JA	I keep my opinions to myself in group discussions.	1 / 2 / 3 / 4 / 5
ST305Q05JA	I speak up to others about things that matter to me.	1 / 2 / 3 / 4 / 5
ST305Q06JA	I take the initiative when working with my classmates.	1 / 2 / 3 / 4 / 5
ST305Q07JA	I wait for others to take a lead.	1 / 2 / 3 / 4 / 5
ST305Q08JA	I find it hard to influence people.	1 / 2 / 3 / 4 / 5
ST305Q09JA	I want to be in charge.	1 / 2 / 3 / 4 / 5
ST305Q10JA	I like to be a leader in my class.	1 / 2 / 3 / 4 / 5

As seen in Table 1, the first column shows the item codes, the second column shows the item content, and the third column shows the information about the item rating scales. The research data were downloaded from the official website (OECD, 2023c) where the PISA results are published.

4. Findings

Firstly, within the scope of the study, based on the research data formed by the samples of Guatemala, Cambodia, Paraguay, and Peru through the implementation of PISA 2022, whether students exhibit multiple leadership profiles was examined. This process was carried out in line with the research question formulated as "Are there different leadership profiles among students according to PISA 2022 data?" Latent Class Analysis (LCA) technique was employed to answer the research question. LCA is a technique commonly used to identify latent groups in large samples. This technique is based on grouping individuals with similar response patterns into the same class based on their response patterns to items. In this respect, the classes to which individuals belong are defined as latent variables and explained through observable variables (Hagenaars & McCutcheon, 2002). Generally, latent class analysis begins with a single-class model where individuals do not differ in response patterns, and the number of classes is increased until the most appropriate model is determined (Lanza et al., 2007). Accordingly, starting from a single-class latent model, parameter estimations were conducted by repeating LCA for models up to a six-class latent model. The model fit criteria for models up to a six-class latent model based on the research data are presented in Table 2.

Table 2. Model Fit Criteria for Determining the Number of Classes.

Model	**BIC***	**Number of Parameters**	**Classification Error**	**Class Sizes**
1 class	387863,05	40	0,0000	-
2 classes	373798,69	51	0,0748	0,65 / 0,35
3 classes	366710,96	62	0,0604	0,73 / 0,21 / 0,06
4 classes	362695,14	73	0,1155	0,50 / 0,38 / 0,08 / 0,04
5 classes	360680,68	84	0,1191	0,51 / 0,36 / 0,06 / 0,03 / 0,04
6 classes	358941,71	95	0,1321	0,45 / 0,41 / 0,05 / 0,03 / 0,03 / 0,03

* BIC (Bayesian Information Criterion).

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In Table 2, Bayesian Information Criterion (BIC), the number of parameters, classification error, and class sizes are compared for six different models. These pieces of information are crucial for determining the model that best fits the data. BIC, also known as the Schwarz Information Criterion, was introduced by Gideon E. Schwarz in a paper published in 1978. BIC is a criterion calculated based on the number of parameters in the model when evaluating model fit in LCA. It is preferred for making comparisons based on corrected probability according to the complexity of the model. Lower BIC values indicate a better fit of the model to the data (Schwarz, 1978). In this table, we can observe that as the number of models increases, BIC values generally decrease. This indicates that more classes improve the model's fit to the data, but the rate of decrease in BIC is also important. The number of parameters indicates the complexity of the model. The fundamental goal of data reduction methods such as LCA is to explain complex data structures with the simplest model consisting of fewer variables. Classification error is a measure of the model's ability to assign individuals to classes correctly. A lower classification error indicates better performance of the model. Class sizes indicate the relative magnitude of each latent class in the dataset. This shows how prevalent a particular class is.

In light of these considerations, when scrutinizing the model fit criteria presented in Table 2, it is imperative to strike a balance among the Bayesian Information Criterion (BIC) values, classification error, and the interpretability of the model when determining the most suitable model. Typically, preference is accorded to a model exhibiting low BIC values alongside a reasonable classification error. Nevertheless, one must also weigh the model's complexity and interpretability. In this instance, the 3-class model may be deemed a prudent selection owing to its notably low BIC value and relatively modest classification error. Moreover, it is discernible that the distribution of class sizes is reasonable. However, the ultimate decision-making authority lies within the domain of the social sciences (Green, 1952), contingent upon additional factors such as the research inquiry, dataset characteristics, and interpretative nuances (Schwarz, 1978). In light of these multifaceted considerations, it appears judicious to employ and report the 3-class latent model. However, in this study, both the 3-class and 2-class models are reported to scrutinize the variation in leadership attributes within the sample cohort vis-à-vis the number of classes. The 3-class model emerges as the most cogent option for the dataset. Thus, in comparison to the 3-class model, the 2-class model yields diminished differentiation among students and furnishes less substantive insights for the sample cohort. The rationale behind eschewing the selection of the 4-class model for comparative analysis predominantly stems from its markedly elevated classification error and the failure of all class sizes to confer meaningful proportions. Consequently, both the 2-class and 3-class models evince superior classification accuracy and evince a judicious distribution concerning class sizes. Profile plots depicting response probabilities for all latent models up to six classes are depicted in Figure 1.

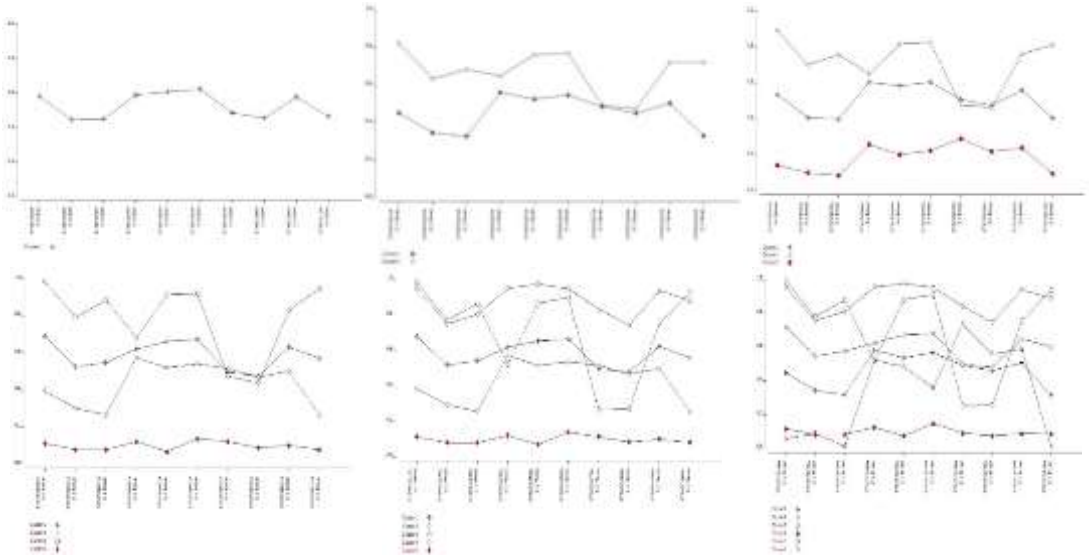

Figure 1. Profile Plots of Response Probabilities for Latent Classes.

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The "Profile Plots of Response Probabilities for Latent Classes" seen in Figure 1 is one of the significant outputs of Latent Class Analysis (LCA). Each line in these plots represents the characteristics of latent classes concerning different criteria, items, or, in other words, observable variables. Each point on the graph represents the mean response of classes for a specific criterion. In simpler terms, these plots illustrate profiles exhibited by individuals with similar response patterns in each graph. When observing Figure 1, it can be noticed that individuals with different profiles in the four, five, and six-class models are intertwined to the extent that they are almost indistinguishable from each other. This situation is also evident from the classification error value interpreted in the preceding paragraph referring to Table 2. As known, classification error is an indicator of the likelihood of errors in determining latent classes by the model. Accordingly, it can be inferred from Figure 1 that four, five, and six-class latent models are more complex and entail more errors in distinguishing participant profiles. Conversely, it can be said that two and three-class latent models yield relatively better results. Interpretation of latent classes or participant profiles based on the graphs of latent models in Figure 1 is possible. However, to enhance the transparency of research findings and enable more detailed examinations, conditional response probabilities of observable variables for two and three-class models are presented in Table 3.

Table 3. Variables for Two and Three-Class Model.

Item	**Item level**	**2-class latent model**		**3-class latent model**		
		Cluster 1 (0,6460)	Cluster 2 (0,3540)	Cluster 1 (0,7259)	Cluster 2 (0,2074)	Cluster 3 (0,0667)
	Strongly disagree	0,9833	0,0167	0,5047	0,0031	0,4922
(ST305Q01JA)	Disagree	0,9672	0,0328	0,9040	0,0043	0,0917
I am comfortable with taking the role in a group.	Neither agree nor disagree	0,8660	0,1340	0,9636	0,0194	0,0170
	Agree	0,5178	0,4822	0,7806	0,2115	0,0078
	Strongly agree	0,1302	0,8698	0,2414	0,7521	0,0065
	Strongly disagree	0,8694	0,1306	0,5724	0,0754	0,3522
(ST305Q02JA)	Disagree	0,8424	0,1576	0,8897	0,0555	0,0548
I know how to convince others to do what I want.	Neither agree nor disagree	0,6360	0,3640	0,8220	0,1695	0,0086
	Agree	0,4023	0,5977	0,6384	0,3576	0,0040
	Strongly agree	0,1516	0,8484	0,2547	0,7433	0,0019
	Strongly disagree	0,9254	0,0746	0,5886	0,0342	0,3772
	Disagree	0,8925	0,1075	0,9140	0,0327	0,0534
(ST305Q03JA)	Neither agree nor					
I enjoy leading others.	disagree	0,6466	0,3534	0,8531	0,1421	0,0047
	Agree	0,3359	0,6641	0,6098	0,3870	0,0032
	Strongly agree	0,0776	0,9224	0,1528	0,8471	0,0001
	Strongly disagree	0,7484	0,2516	0,3820	0,2000	0,4180
(ST305Q04JA)	Disagree	0,7061	0,2939	0,7261	0,1737	0,1002
I keep my opinions to myself in group discussions.	Neither agree nor disagree	0,6840	0,3160	0,8093	0,1678	0,0229
	Agree	0,6524	0,3476	0,8084	0,1702	0,0215
	Strongly agree	0,4193	0,5807	0,5224	0,4487	0,0289
	Strongly disagree	0,9257	0,0743	0,4192	0,0347	0,5461
(ST305Q05JA)	Disagree	0,8840	0,1160	0,8647	0,0344	0,1009
I speak up to others about things that matter to me.	Neither agree nor disagree	0,7725	0,2275	0,8856	0,0878	0,0266
	Agree	0,5822	0,4178	0,7675	0,2182	0,0143
	Strongly agree	0,2859	0,7141	0,3962	0,5903	0,0135
(ST305Q06JA)	Strongly disagree	0,9548	0,0452	0,3939	0,0150	0,5911

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I take the initiative when working with my classmates.	Disagree	0,9066	0,0934	0,8464	0,0245	0,1291
	Neither agree nor disagree	0,7746	0,2254	0,8903	0,0850	0,0246
	Agree	0,5934	0,4066	0,7735	0,2097	0,0168
	Strongly agree	0,2576	0,7424	0,3542	0,6296	0,0162
	Strongly disagree	0,5933	0,4067	0,3930	0,3276	0,2794
(ST305Q07JA) I wait for others to take the lead.	Disagree	0,6636	0,3364	0,7427	0,1938	0,0635
	Neither agree nor disagree	0,6570	0,3430	0,8117	0,1681	0,0202
	Agree	0,6729	0,3271	0,8042	0,1667	0,0291
	Strongly agree	0,5200	0,4800	0,5658	0,3610	0,0731
	Strongly disagree	0,6242	0,3758	0,4068	0,2976	0,2956
(ST305Q08JA) I find it hard to influence people.	Disagree	0,6797	0,3203	0,7628	0,1755	0,0616
	Neither agree nor disagree	0,6451	0,3549	0,7943	0,1849	0,0207
	Agree	0,6494	0,3506	0,7894	0,1885	0,0221
	Strongly agree	0,4975	0,5025	0,5732	0,3808	0,0461
	Strongly disagree	0,8779	0,1221	0,4557	0,0713	0,4730
(ST305Q09JA) I want to be in charge.	Disagree	0,8683	0,1317	0,8671	0,0527	0,0802
	Neither agree nor disagree	0,7061	0,2939	0,8356	0,1405	0,0239
	Agree	0,5642	0,4358	0,7478	0,2324	0,0197
	Strongly agree	0,3474	0,6526	0,4574	0,5164	0,0262
	Strongly disagree	0,9553	0,0447	0,6232	0,0171	0,3597
(ST305Q10JA) I like to be a leader in my class.	Disagree	0,9234	0,0766	0,9249	0,0156	0,0595
	Neither agree nor disagree	0,6702	0,3298	0,8903	0,1036	0,0060
	Agree	0,3192	0,6808	0,6013	0,3954	0,0033
	Strongly agree	0,0859	0,9141	0,1674	0,8291	0,0035

According to the information in Table 3, for the two-class latent model, the first latent class (Cluster 1) encompasses individuals with low comfort with leadership roles and desire to lead, who tend to avoid sharing their opinions in group discussions. This group could be termed as "Reserved or Lack of Confidence Group". The second latent class of the two-class model (Cluster 2) includes individuals who prefer taking on leadership roles and influencing others, generally being active in group discussions and enjoying taking initiative. This group could be labeled as "Active Leader or Influencer Group".

For the three-class latent model, the first latent class (Cluster 1) may consist of individuals who respond neutrally or positively to leadership-related items but do not show a strong inclination towards leadership or influencing others. This group could be referred to as the "Moderate or Passive Leader Group". The second class of the three-class model (Cluster 2) encompasses individuals who strongly enjoy assuming leadership roles and influencing others, actively participating in such roles. This group could be named as the "Strong Leader or Influencer Group". The third class of the three-class model (Cluster 3) may include individuals who exhibit very low probabilities in leadership and influence-related aspects, often avoiding or feeling discomfort with such roles. This group could be designated as the "Avoidant or Discomfort with Leadership Group".

When comparing the two and three-class models, it is observed that the two-class model generally yields two broader groups representing specific behaviors or attitudes. On the other hand, in the three-class model, one or both of these general groups are further elaborated and subdivided into more specialized subgroups. This allows for the identification of more finely tuned groups with specific characteristics, aiding in a more detailed understanding of the behaviors or attitudes of these groups.

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Secondly, within the scope of the research, using the PISA 2022 data, the distribution of students in the samples from Guatemala, Cambodia, Paraguay, and Peru was examined based on latent class analysis using both two and three-class latent models. This process was conducted in line with the research question, which was formulated as "Do leadership profiles exhibited by students vary across countries with different governance styles and cultures?" The results are presented in Table 4.

Table 4. Distribution Probabilities of Research Countries in Two and Three-Class Models.

Country	**2 Class Latent Model**		**3 Class Latent Model**		
	Cluster 1	Cluster 2	Cluster 1	Cluster 2	Cluster 3
Cambodia	0,8262	0,1738	0,8735	0,0595	0,0670
Guatemala	0,5763	0,4237	0,6504	0,2781	0,0715
Paraguay	0,5610	0,4390	0,6628	0,2691	0,0681
Peru	0,0004	0,9996	0,0028	0,9972	0,0000

When examining Table 4, it can be observed that in the two-class model, Cambodia mostly falls into the "Shy or Lack of Confidence Group," whereas in the three-class model, it is more prevalent in the "Moderate or Passive Leader Group." This suggests that students in Cambodia tend to exhibit more reserved or moderate tendencies in leadership-related situations. The distributions for Guatemala and Paraguay, in both countries, there is approximately equal distribution in the two-class model, while in the three-class model, the "Moderate or Passive Leader Group" and "Strong Leader or Influential Group" are more pronounced. This indicates a more diverse range of tendencies among individuals regarding leadership and influence in these countries. Looking at the distributions for Peru, it is observed that almost all students are in the "Active Leader or Influential Group" in the two-class model and in the "Strong Leader or Influential Group" in the three-class model. This suggests that students in Peru tend to be very active and influential in leadership matters.

These interpretations of the research findings imply that latent classes may vary across countries and that certain cultural or societal factors may influence these tendencies.

5. Discussion and Conclusion

In the study, the first latent class (Cluster 1) identified within the two-class model comprises individuals characterized by a low comfort level and desire to take on leadership roles, often avoiding sharing their own opinions in group discussions. This group could be labeled as the "Reserved or Lack of Self-Confidence Group." The second latent class of the two-class model (Cluster 2) consists of individuals who prefer to assume leadership roles and influence others, typically actively participating in group discussions and enjoying taking initiative. This group could be termed the "Active Leaders or Influential Group." For the three-class model, the first latent class (Cluster 1) may include individuals who respond neutrally or positively to items related to leadership but do not exhibit a strong inclination towards leadership or influence. They could be referred to as the "Moderate or Passive Leader Group." The second class of the three-class model (Cluster 2) comprises individuals who strongly enjoy taking on leadership roles and influencing others, actively engaging in such roles. This group could be identified as the "Strong Leaders or Influential Group." Finally, the third class of the three-class model (Cluster 3) may include individuals who exhibit very low probabilities in leadership and influence-related items, often avoiding or feeling discomfort with leadership roles. They could be labeled as the "Avoidant or Leadership-Discomfort Group."

The finding that in Cambodia, students mostly belong to the "Reserved or Lack of Self-Confidence Group" in the two-class model, and predominantly to the "Moderate or Passive Leader Group" in the three-class model suggests that Cambodian students tend to exhibit more reserved or moderate tendencies regarding leadership situations. Analyzing the distributions for Guatemala and Paraguay, while there is roughly equal distribution in the two-class model in both countries, the "Moderate or Passive Leader Group" and the "Strong Leaders or Influential Group" are more pronounced in the three-class model. This indicates a greater variety of tendencies in leadership and influence among individuals in these countries. Examining the distributions for Peru reveals that

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almost all students are part of the "Active Leaders or Influential Group" in the two-class model and the "Strong Leaders or Influential Group" in the three-class model. This suggests a tendency for students in Peru to be highly active and influential in leadership matters. These interpretations of research findings suggest that latent classes may vary across countries and that specific cultural or societal factors may influence these tendencies.

This finding aligns with the findings of the GLOBE project, which examined the relationship between culture and leadership across 25 different societies. The project revealed significant differences in leadership preferences across cultures (Cai et al., 2018). Additionally, the GLOBE project highlighted the emergence of different leadership styles in different cultures (Chhokar et al., 2008), a phenomenon supported by various studies (Atasoy & Çoban, 2021; Brand et al., 2022; Janićijević, 2019; Ly, 2020; Malmir et al., 2013). Moreover, these findings are consistent with the theoretical assumptions of Role Theory and Situational Approach (Cuaresma-Escobar, 2021; Jogulu, 2010; Warner, 2012).

In Guatemala, which has a long history of civil war and violence, the military held power for many years, and subsequently, the democratic governments that were established were also associated with incidents such as human rights violations and corruption. Despite democratically elected governments being in power today, the governance is characterized by a fragile structure due to the high likelihood of elites seizing control of the state administration (Congressional Research Service, 2023). In contrast, Cambodia is classified as a patrimonial or neo-patrimonial state, emphasizing the prevalence of patron-client relationships that extend from the top of the government in a complex pyramidal structure to distant villages. In other words, this country can be considered as a combination of dynastic governance and modern nation-states (Croissant, 2008). On the other hand, Peru, governed by a presidential system and possessing a democratic system (Miş et al., 2016), is observed to be attempting to adopt neo-positivist ideals such as modernization and innovation with the support of the United States (Palmer, 2019). Another country governed by a presidential system is Paraguay (Bağce, 2017). Despite stable growth in the country, there is a noticeable high level of inequality (Beittel, 2017).

The profiles outlined above regarding the countries provide some clues about the leadership profiles of students in the PISA results. Accordingly, individuals in the "Moderate or Passive Leader Group" in Cambodia, where dynastic rule still exists, may be associated with the country's governance structure. On the other hand, the unequal structure in Paraguay and Guatemala, where democracy has not been fully established, may influence the distribution of students' leadership profiles between the "Moderate or Passive Leader Group" and the "Strong Leader or Influential Group." Additionally, in Peru, which is progressing towards becoming a democratic country with the support of the United States, it is believed that students' placement in the "Active Leader or Influential Group" within their leadership profiles is not coincidental. In conclusion, it can be inferred that students in Cambodia, Guatemala, Paraguay, and Peru exhibit different leadership profiles, influenced by the diverse management styles and cultural structures of these countries.

In this study, we examined whether students exhibit different leadership profiles based on the PISA 2022 data and whether these profiles vary across countries with different governance styles and cultures. Regarding leadership profiles, we found that students in two-class models display different characteristics, such as "Shy or Lack of Confidence Group" and "Active Leader or Influential Group," while in three-class models, they exhibit traits such as "Moderate or Passive Leader Group," "Strong Leader or Influential Group," and "Avoidant or Discomfort with Leadership Group." Additionally, we identified variations in the leadership profiles of students in Guatemala, Cambodia, Paraguay, and Peru samples. These findings underscore the significance of the culture-leadership relationship and highlight the necessity of blending globally recognized leadership approaches with local characteristics on a global scale.

6. Limitations

One of the limitations of this study is the restriction of the sample to Guatemala, Cambodia, Paraguay, and Peru. The primary reason for selecting these countries is their similarity in various

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aspects such as population, level of development, and academic performance of students, while differing in terms of their management styles. However, when the study is replicated across the 81 countries included in the PISA sample, different variables may come into play, posing a risk to isolating student leadership profiles from these variables. Another limitation of the study is its reliance on PISA data. While researchers could have designed such a study by developing a new measurement tool or identifying variables directly, conducting such a study on an international scale might have been economically and logistically unfeasible in terms of time, cost, and access. Despite appearing as limitations, these two aspects are quite reasonable in terms of practical implementation. The information obtained in this research is considered valuable in laying the groundwork for more comprehensive studies or serving as a precursor to further research.

7. Practical Implications

Our findings can be used to develop a "universal student leadership" model for educational programs. Our research has revealed that students' leadership characteristics may vary depending on the community they are part of and the governance model of that community. Accordingly, while some students exhibit strong leadership qualities, it has been determined that others demonstrate hesitant or leadership-avoidant traits. However, students' leadership skills are critically important for their ability to assume responsibility in the future, take on specific tasks, and manage crises that may arise in their personal and professional lives. In this regard, developing students' leadership profiles in education systems aimed at fostering future generations to take responsibility and advance their countries is an important goal. Therefore, the results of our research can serve as a reference for the development of educational programs aimed at imparting universally applicable leadership skills beyond local leadership concepts.

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