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## Analysis of Self-efficacy and Attitude-mediated Inclusivity in Higher Education: A Case Study on the Colombian North Coast

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### Abstract

Inclusivity is a fundamental principle of education worldwide as it fosters the general well-being of students, educators, and other parties in the education sector. Moreover, inclusive education is a multidimensional phenomenon that many factors can influence. Thus, understanding the underlying interactions between those factors fostering inclusivity may help to inform decisions taken by the involved parties, such as education-related policymakers. This study examines the relationship between self-efficacy and the attitudes of higher education teachers toward inclusive education. We applied two psychometric survey-like instruments: the Self-Efficacy Scale for Inclusive Teaching Practices and the University and Disability Issues Scale. The study cohort comprised 68 higher education professors from universities in Barranquilla on the Colombian North Coast. We found that professors exhibiting favorable attitudes to adjusting the curricula, as well as higher sensitization and relationships with students in situations of disability, are prone to perceive higher self-efficacy and less extra burden arising from the tasks associated with inclusive education.

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## 1. Introduction

The last decades have seen the rise of essential milestones toward the understanding and care of physically and mentally impaired people and their successful social inclusion. A biopsychosocial approach offering integral attention to this population has been favored over a formerly predominant biological approach [1]. The Colombian Registry of Location and Characterization of People with Disabilities (RLCPD, for its acronym in Spanish) reported that, as of 2018, 1,448,889 people with some kind of disability or impairment, of which 17% were under 24 years old. Among this under-24 population, 43% were not schooled, and 63% of these un-schooled people argued that they perceived this lack of education was strongly driven by the impairment conditions [2]. Likewise, the Colombian National Disability Observatory (endorsed by the Ministry of Health and Social Protection) reported that, as of 2020, only 58% of children and teenagers with disabilities attended school, of which only 4.36% managed to obtain higher education degrees. These data show the barriers to accessing and staying in higher education programs for the population with some impairment.

In inclusive education, professors play a significant role as they can act as facilitators or pose barriers to the participation of their students with disabilities [3]. Some studies have raised concerns about the availability of proper resources to offer good-quality attention to this population [4]. Also, researchers have found that some education workers perceive that inclusivity poses an additional burden of work and responsibilities [3]–[5]. However, if educators implement strategies such as *flipped classroom*, which uses an approach called Smart Management for Flipped Classroom (SAM-FL) and is integrated within the LMS Moodle platform, it allows students to make processes more flexible and gain a priori knowledge before their lectures. This, in turn, gives professors more time to solve students' questions, offer practical experiences of collaborative learning, and provide more personalized attention [6]. The perception of inclusivity-related additional burden of work and responsibilities arises from beliefs that condition attitudes, defined by Fishbein & Ajzen (1975) [7] as the acquired predisposition to respond recurrently favorably or unfavorably towards a given object or situation. For these authors, attitude is a highly valuable input for predicting behavior, considering that a favorable attitude toward a task increases the odds of completing it. Moreover, some studies show that professors' self-efficacy to respond to diversity also influences their behavior [8], as inclusive education requires special skills to face specific challenges with a personalized approach [9]. For Bandura [10], self-efficacy is people's perception of their capabilities to achieve a certain performance level while tackling a task. It refers to what people believe they can achieve with the available resources rather than actual, measurable capabilities.

Some authors have found that self-efficacy influences the lecturing process, but there are few studies on Hispanic American populations. This lack of literature on such populations opens up a path to explore and a body of knowledge to build, especially considering cultural differences regarding self-efficacy. Additionally, education level has been found to mediate the self-efficacy perception among educators [11], [12].

Furthermore, inclusive education is a talking point in the Colombian governmental agenda. It is defined by the Colombian Framework for Inclusive Education [13] as the skills necessary to acknowledge, respect, and promote diversity, with particular attention to minimizing vulnerabilities and including actions that encourage respect and the participation of every community member. Many worldwide efforts are being made to change the way we perceive diversity, such as the emerging use of the term “neurodiverse,” which provides an alternative way to focus on the strengths of mentally impaired people instead of pinpointing the challenges they face due to their conditions [14]. Similarly, Booth & Ainscow [15] proposed replacing the broadly used term “students with special learning needs” with the term “students with learning and participation barriers,” aiming to bring focus to the environmental factors affecting them.

The paper structure is as follows: Section 2 describes the study population and methodology. Section 3 shows the results and discussion, pinpointing the main implications of our findings. Finally, Section presents the conclusions and future lines of work.

## 2. Methods

Subsection 2.1 provides a description of the data-gathering procedure and the experimental setup. On the other hand, Subsection 2.2 explains the Spearman correlation analysis conducted to determine the relationship between the variables involved in the studied phenomenon. All the analyses were performed using R version 4.3.0 (2023-04-21

ucrt). All the datasets and the source code in R for the data analysis are freely available at <https://drive.google.com/drive/folders/1XLCxUZdm6OmnNM2Mf1mBcr8Fuh9ylLjR>.

### 2.1. Data Gathering and Experimental Setup

For this research, we used a quantitative approach with an ex post facto experimental design and a Spearman correlation. The study's general goal was to appraise the relationship between higher education professors' self-efficacy and their attitude toward inclusive education. The study cohort comprises 68 university professors from the Colombian North Coast. The average age within the cohort was 38.5 years, with a 45.6% female population and 54.4% male population. The professors comprising the cohort come from the following faculties of Universidad de la Costa:

Engineering, Economic Sciences, Architecture and Design, Law and Political Sciences, and Social and Human Sciences.

The data-gathering procedure consisted of applying two survey-like instruments to the cohort of professors. The first instrument was the Self-Efficacy Scale for Inclusive Teaching Practices, as outlined by Castro-Leal [16]. This instrument features a Likert scale comprising 13 multiple-choice questions with a discrete, five-level scale. The second applied instrument, the University and Disability Issues Scale, measured attitudes toward inclusive education. This instrument comprises 20 questions related to factors 1 and 4 from the *Issues about University and Disability* Questionnaire proposed by Rodríguez & Álvarez [17]. Like the first instrument, the latter also features a five-level Likert scale for the multiple-choice questions. Additionally, two binary variables were included: i) whether the professor had previous experience with students with disabilities, and ii) whether they perceived no extra burden from the inclusive education-driven tasks.

### 2.2. Spearman Correlation Analysis

We used correlation analysis to determine the underlying interactions between Self-efficacy and Attitude toward inclusivity-related variables. Given the discrete nature of the variables (in a Likert scale) both instruments measure, Spearman correlations are recommended over Pearson correlations [18]. Hence, we calculated all the pair-wise Spearman correlations and determined their significance using Spearman's  $\rho$  statistic and a 95%-confidence hypothesis test [19].

We depicted these correlations graphically using a correlation map (see Fig. 1 in Section 3). Those pair-wise correlations deemed non-significant after the hypothesis test are displayed with a cross, and a red-to-blue palette is used to show the correlation values.

## 3. Results and Discussion

After applying the instruments, we found that the professors' general attitude toward inclusive education is positive (average value of 3.52), so it is for self-efficacy (4.27). Table 1 summarizes these findings. Fig. 1 shows the (Spearman) correlation map we obtained. The variable codes used in Fig. 1 are listed below:

- Attitude.Mod: Attitude to adjusting/modifying the curricula.
- Attitude.Sensitization: Attitude toward sensitization and relationships with students in situations of disability.
- Self.Efficacy.Inclusive.Curricula: Self-efficacy to design inclusive curricula.
- Self.Efficacy.Collaboration: Self-efficacy to collaborate with other parties.
- Qualified.For.Inclusion: Whether the professor has been trained in inclusive education.
- Experience.With.Impaired.People: Whether the professor has previously worked with students with disabilities.
- No.Extra.Burden.Perceived: whether the professor has the perception of no extra burden arising from the inclusive education-driven tasks.

From the Spearman correlation analysis between the dimensions and study variables, we found a significant moderate association between the *attitude to adjusting/modifying the curricula* (Attitude.Mod) and the *sensitization and relationships with students in situations of disability* (Attitude.Sensitization), with a correlation value of 0.33.

Table 1. Instruments' outcomes.

Metric	Attitude to update curricula	Sensitization and relationship with students with disabilities	Self-efficacy to design curricular elements to facilitate the learning process	Sel-efficacy to engage in collaboration with other parties to foster students' participation
Mean	3.35	3.69	4.17	4.37
Standard Deviation	1.32	0.98	0.90	0.83

Also, we found significant, moderate correlations between the *sensitization and relationships with students in situations of disability* (Attitude.Sensitization) and both Sel-efficacy-related variables, i.e., *self-efficacy to design inclusive curricula* (Self.efficacy.Inclusive.Curricula) and *self-efficacy to collaborate with other parties* (Self.Efficacy.Collaboration), with correlation values of 0.33 and 0.44, respectively.

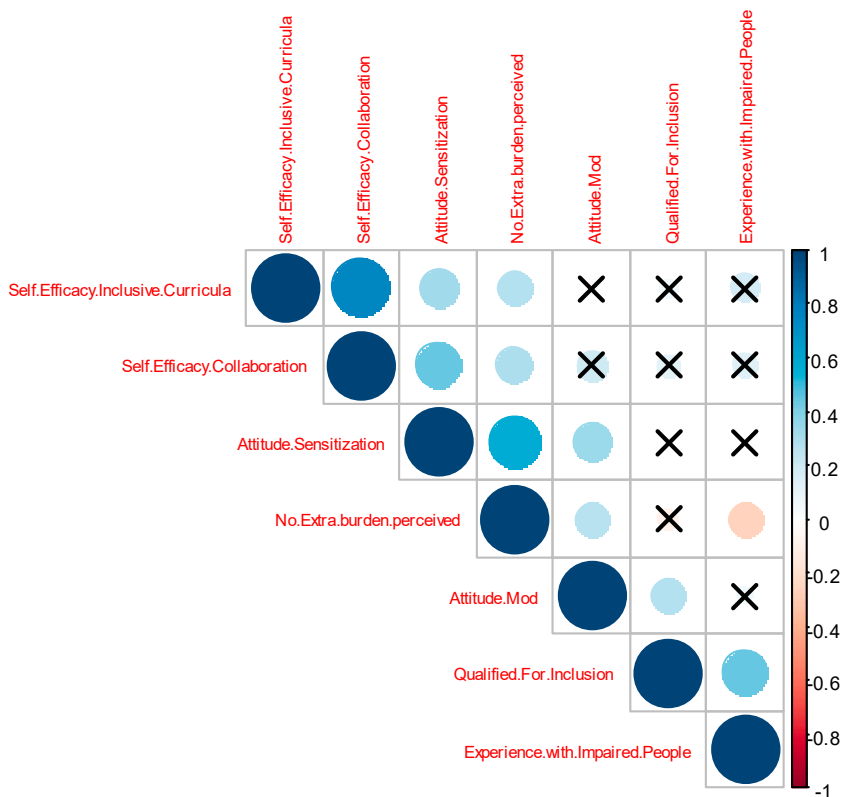


Fig. 1. Spearman correlation structure.

The literature search showed that usually, professors perceive that inclusivity leads to an increased work burden. Nevertheless, we found a strong, positive correlation (0.57) between the variable *attitude.Sensitization* and the *perception of no extra burden from the inclusive education-driven tasks* (No.Extra.Burden.Perceived ). Finally, we found a small, yet significant, negative correlation (-0.26) between the variables *No.Extra.Burden.Perceived* and

Experience. With Impaired People. This negative correlation arises because, as explained by Robinson (2017) [8], inclusivity requires special skills and extra effort to face challenges with a personalized approach.

#### 4. Conclusions

A literature review shows that inclusive education is a major driver that promotes the well-being of students, professors, and other actors involved in higher education. Additionally, it is noticed that inclusive education spans many dimensions, making it a complex phenomenon with many factors affecting it. This research assessed the relationship between self-efficacy and the attitudes of higher education teachers toward inclusive education by applying two psychometric survey-like instruments to a cohort of 68 higher education professors from the North Coast of Colombia.

The exploratory analysis of the instruments' outcomes showed that the highest attitude scores were those associated with sensitization and relationships with students with disabilities. In addition, we used Spearman correlation analysis to unravel the underlying pair-wise interactions between the variables involved in the inclusive education phenomenon. We found that educators with positive attitudes to adjusting the curricula, as well as higher sensitization and relationships with students in situations of disability, tend to perceive a higher self-efficacy and less extra burden while engaging in the tasks related to undertaking inclusive education.

Although we found a generally positive attitude towards inclusivity, we also observed some ambivalences that underpin the need to insist on strengthening the principles of curricular flexibility in various specific aspects since there is resistance to adjusting contents, objectives, and deadlines. These findings align with those of Rodríguez & Álvarez [17]. Thus, a good attitude does not always lead to positive actions favoring inclusion.

Finally, the results of this research show a positive attitude toward inclusive behavior and a good level of perception of behavioral control or self-efficacy. These elements inform the intentions of taking favorable actions to include students with disabilities.

Future research should focus on including the subjective norm for the analysis, as it allows for behavior predictions regarding the inclusivity-related actions professors would take. As the literature suggests [6], understanding the underlying interactions between those factors (including the subjective norm) promoting inclusivity is a valuable input to inform decisions taken by education-related policymakers, professors, deans, and other parties engaged in higher education.

#### References

- [1] Ministerio de Educación Nacional. (2017). Documento de orientaciones técnicas, administrativas y pedagógicas para la atención educativa a estudiantes con discapacidad en el marco de la educación inclusiva. Bogotá. [https://www.mineducacion.gov.co/1780/articles-360293\\_foto\\_portada.pdf](https://www.mineducacion.gov.co/1780/articles-360293_foto_portada.pdf).
- [2] Ministerio de Salud y Protección Social de Colombia. (2019). Sala situacional de las Personas con Discapacidad. <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/DE/PS/sala-situacion-discapacidad.pdf>.
- [3] L. Angenscheidt Bidegain and I. Navarrete Antola, "Actitudes de los docentes acerca de la educación inclusiva," *Ciencias psicológicas*, vol. 11, no. 2, pp. 233–243, 2017.
- [4] A. Collado Sanchis, R. Tárraga Mínguez, I. Lacruz Pérez, and P. Sanz Cervera, "Análisis de actitudes y autoeficacia percibida del profesorado ante la educación inclusiva," *Educ.* 2020, vol. 56, num. 2, p. 509-523, 2020.
- [5] D. E. Sevilla Santo, M. J. Martín Pavón, and C. Jenaro Río, "Actitud del docente hacia la educación inclusiva y hacia los estudiantes con necesidades educativas especiales," *Innovación Educ. (México, DF)*, vol. 18, no. 78, pp. 115–141, 2018.
- [6] F. Louhab, A. Bahnasse, F. Bensalah, A. Khiat, Y. Khiat, and M. Talea, "Novel approach for adaptive flipped classroom based on learning management system," *Education and Information Technologies*, vol 25, pp. 755-773, 2020.
- [7] M. Fishbein and I. Ajzen, "Belief, attitude, intention, and behavior: An introduction to theory and research," 1977.
- [8] R. Reina, S. Healy, A. Roldán, I. Hemmelmayr, and A. Klavina, "Incluye-T: a professional development program to increase the self-efficacy of physical educators towards inclusion," *Phys. Educ. Sport Pedagog.*, vol. 24, no. 4, pp. 319–331, 2019.

- [9] D. Robinson, “Effective inclusive teacher education for special educational needs and disabilities: Some more thoughts on the way forward,” *Teach. Teach. Educ.*, vol. 61, pp. 164–178, 2017.
- [10] A. Bandura, “Pensamiento y Acción: Fundamentos Sociales de la Personalidad,” Ediciones Martínez Roca, SA, 1987.
- [11] Y. C. Moreno and A. B. Blanco, “Una revisión de la investigación educativa sobre autoeficacia y teoría cognitivo social en Hispanoamérica,” *Bordón Rev. Pedagog.*, vol. 68, no. 4, pp. 27–47, 2016.
- [12] E. Emmers, D. Baeyens, and K. Petry, “Attitudes and self-efficacy of teachers towards inclusion in higher education,” *Eur. J. Spec. Needs Educ.*, vol. 35, no. 2, pp. 139–153, 2020.
- [13] Ministerio de Salud y Protección Social de Colombia. (2020). Sistema integrado de información de la protección social (SISPRO). <https://www.sispro.gov.co/Pages/Home.aspx>.
- [14] G. Amador Fierros et al., “Neurodiversidad en la Educación Superior: la experiencia de los estudiantes,” *Rev. la Educ. Super.*, vol. 50, no. 200, pp. 129–151, 2021.
- [15] T. Booth, M. Ainscow, K. Black-Hawkins, M. Vaughan, and L. Shaw, *Índice de inclusión. Desarrollando el aprendizaje y la participación en las escuelas*. 2000.
- [16] J. P. Castro Leal and others, “Validación de una escala de autoeficacia del profesor universitario de pregrado sobre su capacidad para implementar prácticas docentes que favorezcan la inclusión de estudiantes con discapacidad, en la Ciudad de Concepción,” 2017.
- [17] A. Rodríguez-Martín and E. Álvarez-Arregui, “Universidad y discapacidad Actitudes del profesorado y de estudiantes,” *Perfiles Educ.*, vol. 37, no. 147, pp. 86–102, 2015.
- [18] G. Norman, “Likert scales, levels of measurement and the ‘laws’ of statistics,” *Adv. Heal. Sci. Educ.*, vol. 15, pp. 625–632, 2010.
- [19] J. H. Zar, “Significance Testing of the Spearman Rank Correlation Coefficient,” *J. Am. Stat. Assoc.*, vol. 67, no. 339, pp. 578–580, Sep. 1972.