

Co-production and Education Quality: The Case of Parents' Associations in Souss-Massa (Morocco)

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Abstract: As a foundation of economic development, service provision has evolved alongside public governance and shifted toward participatory approaches that actively engage citizens in the design and delivery of public services. Co-production, as an approach to citizen participation in service provision, has gained the interest of researchers and policy makers over the last two decades. Despite the growing body of research, there is still a need for more empirical evidence and methodological diversity to evaluate the outcomes of co-production. The aim of this paper is to assess the extent to which the approach helps achieve efficiency and effectiveness in service provision by investigating the relationship between co-production and education quality from citizens' perspective. The data, for this study, were collected through survey questionnaire on a sample of 132 members of parents' associations in Souss-Massa region in Morocco and were analyzed using partial least squares structural equation modeling (PLS-SEM) method. The findings confirmed the theoretical assumptions regarding the positive impact of co-production activities in schools on education quality, demonstrating a significant positive relationship between the two variables. However, the anticipated moderating effect of professionals' engagement on this relationship was found to be statistically insignificant.

Keywords: Co-production, Education Quality, Parents' Associations, Morocco, PLS-SEM

1. Introduction

Effective service provision is a foundation of economic development, as it directly influences human capital, productivity, and societal well-being. High-quality public services, particularly in education, health and infrastructure, equip individuals with the skills and resources necessary to contribute to economic growth while reducing poverty and inequality. In the era of the new public governance model, characterized by participatory frameworks, service provision has progressively shifted toward collaborative approaches that emphasize citizens' active contributions to improve service quality, efficiency and responsiveness.

Although citizen participation in public service provision is often highlighted as a modern practice promoted by the principles of the new public governance, the involvement of citizens in shaping and delivering public services is far from new. Across various societies and historical contexts, individuals and communities have actively contributed to the provision of public goods and services, whether through voluntary efforts, resource-sharing or collaborative decision-making. What distinguishes the current era is the institutionalization and formal recognition of participatory practices as integral to governance frameworks.



A notable approach to citizen engagement is the co-production of public services, which entails collaboration between traditional service providers, such as local authorities or governmental organizations, and service users and communities to jointly design and deliver public services. The concept of co-production emerged in the 1970s through the work of Elinor Ostrom and her colleagues, emphasizing that citizens are co-producers of public services through their contributions (see: Ostrom et al., 1978; Ostrom et al., 1979; Parks et al., 1981). By analyzing the process of public service provision and examining the citizen-state relationship, Ostrom argued that public organizations relied heavily on citizens' support, just as the citizens relied on public organizations and she, later, identified the necessary conditions for fostering co-production (see: Ostrom, 1990).

Over the past two decades, co-production literature has evolved significantly, which reflects a growing recognition of the collaborative model and citizens' roles in public service provision. Research in this field has revealed that involving service users in the provision of public services can lead to improving the quality and increasing the quantity of these services (see: Percy, 1984; Ostrom, 1996; Bovaird, 2007). The positive effect of co-production on service quality is attributed to the inclusion of service users' insights, experiences and innovation in the service design and delivery, resulting in better meeting of citizens' needs and producing more impactful and efficient outcomes.

Although research on co-production has provided case-specific and contextual evidence suggesting that the approach enhances service quality, there remains limited conclusive evidence to substantiate this claim (Honings et al., 2020). Furthermore, its positive impact on service quality is difficult to assert due to the multifaceted nature of co-production. The concept manifests in diverse forms across various contexts and involves a wide range of actors with differing levels of engagement, which can significantly influence outcomes and result in varying findings. These complexities pose significant challenges for policymakers seeking to implement co-production, as the findings of such studies are often context-dependent. This highlights the need for more nuanced investigations that consider contextual factors and the dynamic processes shaping co-production outcomes.

This study aims to address the gap in the literature, specifically the lack of evidence on the positive impact of co-production on service quality, by investigating the relationship between co-production and education quality from citizens' perspective. Specifically, the study focuses on education in Morocco, a context that has seen a growing trend of increased citizen involvement in service provision over the past decade. It examines the case of parents' associations, through which citizens contribute to education by providing resources and actively participating in decision-making processes. Using a quantitative approach, the study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the relationship between co-production and education quality and offers valuable empirical insights into the dynamics of co-production and its role in public service improvement.

2. Research Method

2.1. Theoretical framework and research hypothesis

2.1.1. Co-production and education quality

Co-production is considered as crucial in public governance overall, particularly for achieving positive outcomes in service provision. Implementing the concept can yield positive effects on services and longer-term benefits for the co-producers because co-production practices transform the relationship between service users and regular providers, helping to make public services more responsive to citizens' needs and leading to improved outcomes and more efficient use of resources (Pestoff, 2006).

The enthusiasm for co-production and the desire to achieve better outcomes in public service provision have prompted many governments worldwide to implement the concept. In this regard, the OECD (2011) conducted a study on various public services in 26 countries to identify the reasons behind the implementation of co-production. The study results indicated that co-production activity is most prevalent in the areas of education, economic affairs and social protection. Moreover, the study showed that the primary reasons for implementing co-production and collaborating with citizens in public service provision in the countries studied are achieving efficiency and effectiveness rather than cutting costs. As such, the findings indicated that governments are collaborating with citizens primarily to involve them (69%), improve service quality (60%), and enhance effectiveness while achieving greater value for money (57%), with cost savings being a lower priority (29%).

Improving service quality has been recognized, by researchers, not only as a significant positive outcome of co-production since its emergence in the 1970s but also as an essential objective. Therefore, many definitions of the concept emphasize quality improvement in public services as a primary goal of co-production (see: Brudney and England, 1983; Alford, 2009). For education, improving the quality of the service is a key factor for achieving sustainable societal development and a top priority for policymakers. Co-production appears to offer a new path toward this goal by involving the parents and leveraging their expertise as service users. Their ability to innovate in the provision of education extends beyond traditional methods, contributing to higher quality outcomes.

For many public services, co-production is seen not only as a quality improvement tool but also as an essential, inalienable and intrinsic component in the production process, since service delivery cannot occur without co-production (Osborne and Strokosch, 2013). In education, co-production refers to the engagement and participation of parents, educators and public professionals in the provision of learning activities within the school as well as the development of educational policies and decision-making with public authorities. Effective co-production practices largely depend on collaboration and mutual understanding among these stakeholders to build a robust educational framework and foster a productive and positive school environment.

The fundamental argument supporting the positive impact of co-production on service quality is that when citizens take a proactive role in the production process, services become more closely aligned with their interests and needs, leading to greater satisfaction with the services provided (Pestoff, 2006; Voorberg et al., 2014). In education, parents can play a crucial role in promoting the students' learning by helping improve the quality of educational services and reinforcing the legitimacy of the school (Higgins and Katsipataki, 2015). In other words, when all the stakeholders involved in co-production of education are engaged and collaborate effectively, the outcome is often enhanced service quality and more meaningful support. Co-production enables students, parents, and school professionals to gain a better understanding of different perspectives and work together to address challenges, which can lead to more satisfying outcomes for everyone.

Research on co-production in education has provided insight into the various activities and practices that can exist within the educational sector. These studies have also provided insights on the impact of implementing the concept of co-production in education and its potential to improve service quality. One of the earliest empirical evidence in the literature demonstrating the positive effects of co-production on education quality comes from a case study by Ostrom (1996) on primary schools in Nigeria. Her study revealed that user and community involvement in education led to improvements in quality and quantity, as well as greater efficiency in service delivery compared to the provision of educational services by state-only. Moreover, her findings showed that excluding citizens and

discouraging their contributions to primary education resulted in a decline in the quality of educational services and a decrease in student enrollment in public schools.

Research and contributions in recent years have significantly expanded the literature on the effect of co-production on education quality. It has indicated that co-production activities, such as parent-teacher partnerships and community engagement in schools, can lead to improved educational outcomes (see: Vamstad, 2012; Jakobsen and Andersen, 2013; Brand and Rolland, 2018; Suslova, 2018). Notably, Honingh et al. (2020) conducted a systematic literature review of 122 articles that presents an overview of co-production in primary schools and offers an analysis of its effects on quality. Their findings revealed that numerous studies examining the impact of co-production on knowledge acquisition confirmed a positive correlation between parental involvement programs and their children's learning performance.

Despite empirical evidence in the literature, the effect of co-production on education quality remains difficult to assess, and the concept is still far from becoming a foundational tool in public policies for enhancing the quality of educational service (Honingh et al., 2020). The argument is that implementing co-production in education, in most studies reviewed in the systematic analysis, often focuses on specific socio-economic or demographic groups with the goal of engaging them to reduce achievement gaps (Ibid.). This approach can limit the external validity of the results, making it challenging to assess the effects of co-production on educational service quality in other contexts.

Based on our literature review and earlier analysis, we propose that there is a positive relationship between co-production and education quality. Therefore, we suggest that as parental participation and their engagement in co-production activities related to education increases, the quality of the service is likely to improve. Formally stated, the hypothesized relationship is as follows:

H1: Participation of parents and their engagement in co-production activities related to education will improve the quality of the service.

2.1.2. The moderating role of professionals' engagement

It has been widely acknowledged that in the context of co-production, the role of professionals has shifted from being sole producers and experts to acting as coordinators and facilitators (Verschuere et al., 2012). This transition may be perceived as a reduction in professional duties or a relinquishment of their authority to citizens. Such a misunderstanding of co-production may account for the resistance or lack of engagement among professionals when it comes to implementing co-production activities.

Despite collaborating with citizens in the delivery of public services, professionals remain key players in the co-production process. Their true role is to effectively harness and operationalize the contributions of citizens. For instance, Tuurnas (2016) emphasized the significance of professionals' role as pivotal figures acting as intermediaries between management, policymakers, and citizen co-producers.

Public sector professionals' perception of their roles and responsibilities plays a critical role in their engagement in co-production and, consequently, in the success of its initiatives. Numerous examples in the literature highlight successful co-production across various sectors (e.g., health, education, security, justice) where professionals are actively involved, maintain open interactions with citizens, and are willing to share information (see: Van Eijk and Steen, 2016; Tuurnas, 2016; Verschuere et al., 2012).

The implementation of co-production leads to an evolution in the role of professionals and certainly necessitates the development of their professional skills. Bovaird and Löffler (2012) argue that embracing the concept of co-production requires training professionals to adequately fulfill their new

roles and associated responsibilities. Given that the roles of professionals are becoming more complex, they may encounter new functions or tasks beyond their current skill sets. In other words, professionals should be able to recognize the potential of co-producers, leverage their abilities, and provide them with the freedom to innovate and contribute their perspectives on service delivery. This demands that professionals adopt new approaches beyond the bureaucratic practices they are accustomed to in their work environment.

As our study evaluates the effect of co-production on education quality from a citizens' perspective and considering the significant role of professionals and the importance of their active participation in co-production activities, we propose that the engagement of professionals serves as a moderating factor in the relationship between co-production and education quality. In this paper, by "Engagement of professionals", we mean that professionals are convinced of the utility of co-production, aware of the importance of their contribution, and willing to actively collaborate with citizens. In other words, it signifies that professionals actively participate in co-production and are not merely involved due to their legal obligation as officials in public organizations. Formally stated, we hypothesized it as follows:

H2: Engagement of professionals moderates the positive effect of co-production on education quality.

Since co-production is based on the engagement of citizens and professionals in service provision, we developed a research framework that portrayed co-production as a process where parents participate in the design and delivery of education and we established the link between co-production and education quality as well as the engagement of professionals as a moderator variable fostering this relationship. We present our theoretical model below (Figure 1), which forms the foundation for our quantitative study.

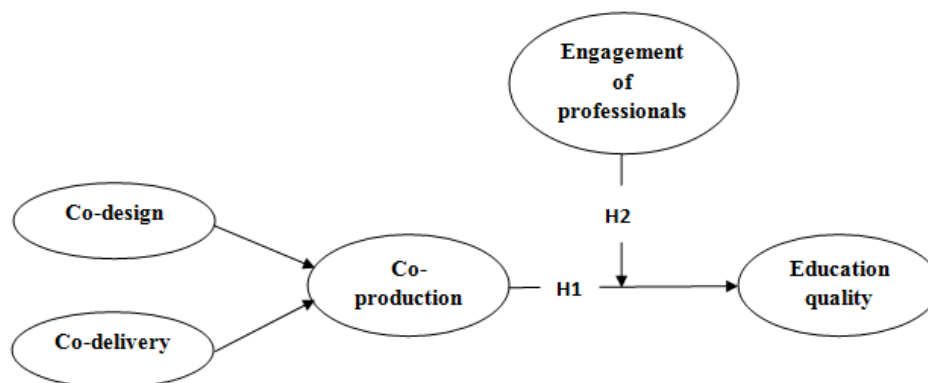


Figure 1. Theoretical model (Source: Authors)

2.2. Methodology

2.2.1. Sample and data collection

Our research objective is assessing the extent to which co-production helps achieve efficiency and effectiveness in service provision by investigating the relationship between co-production and education quality from citizens' perspective. To achieve this objective, we have chosen to focus our study on parents' associations in Souss-Massa region in Morocco. To ensure a comprehensive understanding of the diverse perspectives of parents involved in the co-production of educational services, participants were carefully selected from active parents' associations in Souss-Massa region among the lists provided by the regional academy of education. The selection process prioritized

diversity, including parents from both urban and rural areas, varying economic backgrounds, and representing both elementary and secondary schools. This approach aimed to capture the wide range of experiences and insights that shape the co-production process in different educational and socioeconomic contexts.

We collected data through a self-administered questionnaire, which was developed, adjusted, and adopted based on the literature. All constructs were evaluated in the questionnaire using at least three closed-ended questions, with responses rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The cover page of the questionnaire outlined our research goals and assured the participants about the confidentiality of their responses. Respondents were asked to answer all questions based on their personal experiences as members of parents' associations and as co-producers of education. Within six weeks of the initial mailing, 72 responses were received. Over a two-month period, follow-up efforts with non-respondents ultimately increased the number of usable responses to 132.

2.2.2. Variable measurement

Co-design and co-delivery were modeled as first-order constructs; each measured using three reflective items based on the definition of co-production in the literature, which refers to the involvement of citizens in the design and delivery of public services. Co-production was modeled as a second-order construct and measured using the manifest variables co-design and co-delivery, thus the six items of these variables served as indicators for co-production. Education quality was modeled as a dependant variable and measured using four formative items representing four indicators: parents-school relationship, students' knowledge acquisition, learning environment, learning materials and infrastructure. The engagement of professionals was modeled as a moderator variable, fostering the positive relationship between co-production and education quality and it was measured by three reflective items. The following table presents the research variables, their items and their indicators.

Table 1. Research variables, items and indicators. (Source: Authors)

Variables	Items	Indicators
Co-design	CDS-1 CDS-2 CDS-3	Parents participation in the design of educational services
Co-delivery	CDL-1 CDL-2 CDL-3	Parents participation in the delivery of educational services
Education Quality	EDQ-1 EDQ-2 EDQ-3 EDQ-4	Parents-school relationship; Students' knowledge acquisition; Learning environment; Learning materials and infrastructure.
Engagement of Professionals	ENGP-1 ENGP-2 ENGP-3	Engagement of professionals and their collaboration with parents in co-production activities in schools

3. Results

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) method due to its suitability to assess the relationship between co-production and education quality for several reasons, making it an ideal choice for our research. PLS-SEM is a useful method for analyzing theoretical and complex relationships between latent variables through combining multiple measurement scales items (Tomarken and Waller, 2005). PLS-SEM efficiently manages formative constructs (also known as composites) without imposing strict constraints on the model (Hair and Alamer, 2022). It is also advantageous for working with smaller sample sizes in comparison to other methods. This is achieved through iterative adjustments between optimizing the measurement model and the structural model, back and forth until predictive accuracy is maximized, prioritizing it over model fit (Ibid.).

The analysis and testing of our hypotheses using the PLS-SEM method typically involve a two-stage evaluation process: assessing the measurement model (Outer model) and then the structural model (Hair and Alamer, 2022). We used SmartPLS V3 software to analyze the data collected. Some outputs from the software will be presented in this section, while others will be included as appendix at the end of this paper for reference.

3.1. Assessment of the measurement (outer) model

We started with the reflective constructs and then proceeded to the formative constructs, following the guidelines provided by Hair et al. (2021), and Hair and Alamer (2022).

To evaluate reflective constructs, factor loading, composite reliability (CR), convergent validity, and discriminant validity were assessed. The items in the measurement model should be retained only if their standardized loadings are equal to or exceed 0.7. Convergent validity was examined through composite reliability and the average variance extracted (AVE). As shown in Table 2, all items were retained in the model, with the calculated values for the indices ranging from 0.74 to 0.94, indicating strong internal consistency.

Table 2. Factor loading, average variance extracted and composite reliability.

Constructs	Items	Loading	AVE	CR
Co-design	CDS-1	0,905	0,797	0,922
	CDS-2	0,876		
	CDS-3	0,897		
Co-delivery	CDL-1	0,822	0,749	0,899
	CDL-2	0,921		
	CDL-3	0,850		
Engagement of Professionals	ENGP-1	0,924	0,856	0,947
	ENGP-2	0,927		
	ENGP-3	0,925		

Discriminant validity represents the extent to which a construct is distinct from others within the model. This was evaluated using the Heterotrait–Monotrait (HTMT) ratio of correlations. Discriminant validity problems are present when the HTMT values exceed the value of 0.85. As shown in Table 3, the results indicate that the HTMT values for all constructs in the research framework remain below this value.

Table 3. Heterotrait–Monotrait (HTMT) ratio of correlations.

	Co-delivery	Co-design	Engagement of professionals
Co-delivery			
Co-design	0.513		
Engagement of professionals	0.327	0.210	

For assessing the measurement model of formative constructs, we examined convergent validity through the redundancy analysis; indicator collinearity through the variance inflation factor (VIF), and the statistical significance and relevance of the indicator weights. Our results showed that the correlation between the formatively measured construct and the reflectively measured item is 0.89 which exceed 0.708 value suggested by Hair et al. (2021). This indicates that the construct explains more than 50% of the variance of the alternative measure. To assess indicator collinearity, the variance inflation factor (VIF) is commonly used as the standard metric. Higher VIF values suggest greater collinearity, with values of 5 or above signaling potential collinearity issues. As shown in Table 4, VIF values of our formative construct are below 3 and imply no collinearity problems.

Table 4. Variance Inflation Factor (VIF).

	VIF
EDQ-1	1.800
EDQ-2	2.198
EDQ-3	2.273
EDQ-4	2.084

Finally, we examined the statistical significance and relevance of the indicator weights. Weights are typically assessed as statistically significant at $p \leq .05$. As shown in Table 5, two indicators are not significant. Therefore, we examined the outer loading and the values were clearly greater than 0.5, allowing us to retain all the items.

Table 5. Statistical significance indicator weights.

	Initial sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-Value	P-Value	Loading
EDQ-1 -> Education quality	0.277	0.270	0.114	2.442	0.015	0.636
EDQ-2 -> Education quality	0.116	0.127	0.142	0.814	0.416	0.783
EDQ-3 -> Education quality	0.157	0.160	0.115	1.374	0.169	0.794
EDQ-4 -> Education quality	0.663	0.648	0.115	5.744	0.000	0.917

3.2. Assessment of the structural (inner) model

Once the reliability and validity of the constructs were established and the quality of the outer model deemed satisfactory, the structural model's appropriateness was assessed. This evaluation included an examination of collinearity, the significance of path coefficients, the explanatory power of the research model, and its predictive capability (Hair et al., 2021).

The coefficients in a structural model, that describe the relationships between constructs, are obtained by estimating a set of regression equations. Strong correlations among predictor constructs can lead to biased point estimates and standard errors, so it is important to check the structural model regressions for any potential collinearity issues (Hair et al., 2021). To address this, the variance inflation factor (VIF) values were examined to ensure high correlations among the constructs, thus avoiding methodological and interpretative challenges. As presented in Table 6, the VIF values for the predictor constructs range from 1.103 to 1.283, which confirms that collinearity is not a concern in the structural model.

Table 6. Collinearity test of the structural model (VIF).

	Co-production	Education Quality
Co-delivery	1,267	
Co-design	1,283	
Co-production		1,272
Education Quality		
Moderator effect		1.262
Engagement of professionals		1.103

The assessment of significance of the path coefficients relies on bootstrapping standard errors, which are used to calculate p-values of path coefficients and bias-corrected confidence intervals (Hair and Alamer, 2022). A path coefficient is considered significant at the 5% level. Thus, the hypothesis is accepted if $P \leq 0.05$ and it is rejected above this value (Ibid.). Regarding relevance, path coefficients typically range from -1 to $+1$, with values closer to -1 indicating strong negative relationships, while coefficients close to $+1$ indicating strong positive relationships (Hair et al., 2021). Table 7 and figure 2 present the results of the evaluation of significance of the path coefficients and hypothesis testing. The results show that the relationship between our variables (co-production and education quality) is positive and significant, as the path coefficient is positive (0.63) and the p-value ≤ 0.05 . However, the moderating effect of the engagement of professional is not significant. Hence, hypothesis 1 is supported and hypothesis 2 is not supported by the data. In other words, the findings indicate that greater engagement and participation of parents in co-production of education significantly helps enhance education quality. As a moderator, the engagement of professionals was shown to be not a powerful explanatory variable that fosters the relationship between co-production and education quality.

Table 7. Results of hypotheses testing.

	Path Coefficients	T-Value	P-Value
Co-delivery -> Co-production	0.546	13.368	0.000
Co-design -> Co-production	0.624	15.043	0.000
Co-production -> Education quality	0.638	8.840	0.000
Effet modérateur 1 -> Education quality	-0.109	1.874	0.061
Engagement of professionals -> Education quality	0.240	3.711	0.000

Note: Bootstrapping test based on 10000 iterations at 5% significance level.

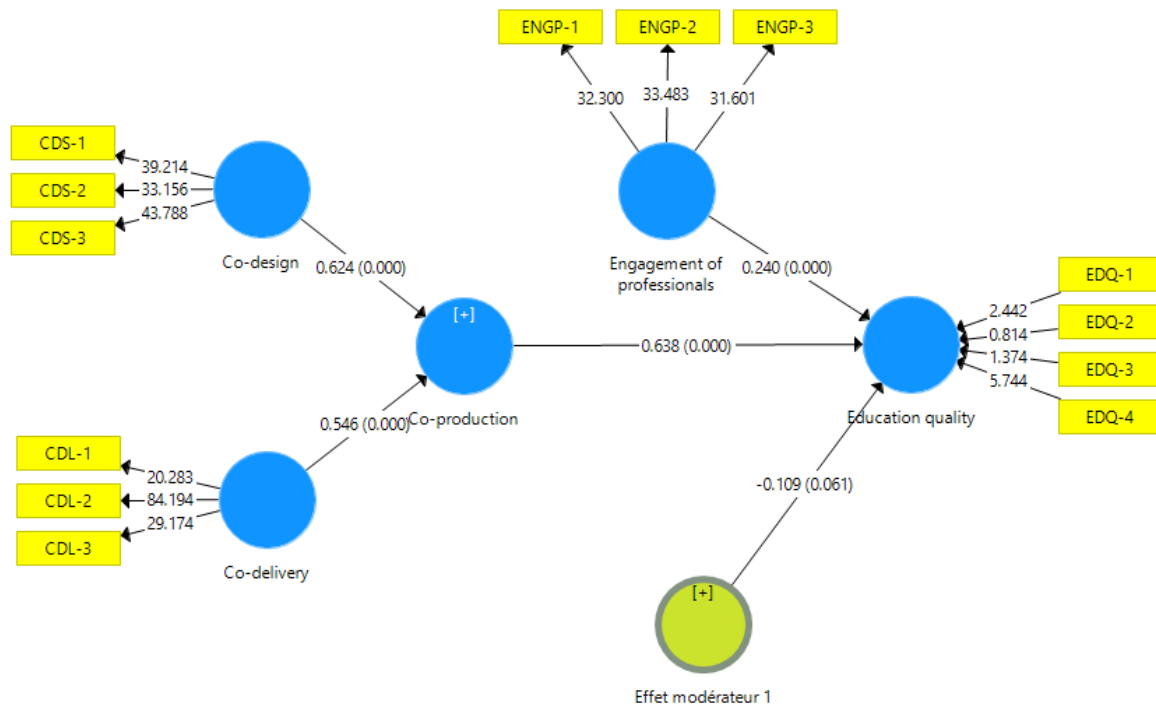


Figure 2. PLS results of the structural model.

The explanatory power of the model is evaluated using the coefficient of determination (R^2). However, the adjusted R^2 is often preferred, as it considers the size of the model. The findings of this study indicate a strong explanatory power (65%).

The last step of assessment of the structural model is the predictive power of the research model. The nonparametric cross-validated redundancy measure Q^2 , which employs the blindfolding reuse technique to predict endogenous construct items, is commonly used to evaluate the predictive validity of the constructs. Q^2 values above 0 reveal lower prediction errors compared with the simplest benchmark (Hair et al., 2017). In this study, Q^2 values of the model are: 0.55 and 0.37, indicating respectively medium and large predictive relevance of the path model.

4. Discussion

Citizen participation has deep roots in Morocco, where informal institutions have historically played a vital role, particularly in rural areas, in managing resources like water and irrigation systems (see: Azemzi et al., 2020; Erraoui et al., 2021). In modern times, citizen participation has become more

structured, primarily through associations. In the education sector, citizen involvement was institutionalized as early as the 1960s with the establishment of associations. However, many of parents' associations remained inactive until recent years, when the government introduced regulations to expand their roles and responsibilities.

The Moroccan education system faces persistent challenges, particularly in ensuring quality and equity. These issues call for innovative solutions to improve educational outcomes and bridge gaps in access. Co-production offers a potential approach to enhance service quality by fostering parental involvement in school management, decision-making and resource improvement. This research investigates the positive outcomes of co-production by examining the relationship between co-production and education quality from citizens' perspective in Morocco.

The study focuses on the case of parents' associations to assess the effect of parental contribution and their active participation in education on service quality, while also exploring the role of professionals' engagement in fostering this effect. The evolution of parents' associations in Morocco, supported by expanded mandates and responsibilities assigned by public authorities over the years, has played a significant role in encouraging parents' engagement in co-production activities within schools. Today, these associations can be considered as vital conduits that promote collaboration between parents and education professionals in schools.

Drawing insights from key public documents that regulate the missions of parents' associations and their contributions to education—Royal Decree No. 1-58-376 (1958), the National Charter for Education and Training (1999), and Decree No. 475.20.2 (2021)—it becomes evident that these associations actively engage in various activities centered on four key axes. Firstly, they facilitate communication between schools and parents, fostering dialogue to address parental concerns, understand student needs and ensure appropriate responses from educational institutions. Secondly, they provide crucial support for educational initiatives, including procuring educational materials, financing extracurricular activities and supporting incentive programs. Thirdly, they contribute to cultivating a positive school environment by promoting social responsibility and behaviors conducive to effective learning, often through organizing awareness campaigns for students. Finally, they collaborate closely with the Ministry of Education in the design of school programs and the management of educational affairs.

The results of our study indicated that co-production activities have a positive effect on education quality. Data analysis demonstrated a significant and positive relationship between co-production and education quality, aligning with findings from prior research that employed different methodologies. These findings reflect the crucial role played by co-production practices in the provision of education and the enhancement of the service quality within the Moroccan context in general and Souss-Massa region in particular.

The positive effect of co-production on education quality can be understood through insights from the literature in this field. Beyond citizen involvement, innovation emerges as a critical factor driving co-production and significantly enhancing the quality of public services (Voorberg et al., 2015). Innovation is increasingly recognized as a cornerstone of effective public service delivery. In the realm of education, it plays a pivotal role in revitalizing and maintaining service quality by enabling the development and application of new ideas, methods, and practices within the production process. These innovations not only enhance existing educational services but also foster the creation of new ones (Rubalcaba, 2022). However, the extent to which co-production impacts education quality and performance is strongly influenced by whether students and their parents take an active or passive role

in the production process and their ability to incorporate their experiences as service users to drive innovation (Rubalcaba, 2022).

The importance of innovation in education can be explained through three main ideas: it enables educational systems to align with the evolving nature of human societies, helps address societal challenges, combats academic failure and enhances the efficiency and quality of educational services (Rubalcaba, 2022). Nevertheless, research on educational innovation has predominantly concentrated on pedagogical, technological or regulatory aspects, neglecting the role of co-production and the involvement of service users and the broader community (ibid.).

Regarding the moderator effect of the engagement of professionals on the relationship between co-production and education quality, our results showed that it is not significant. The engagement of professionals in co-production activities is considered in the literature as an important element that helps achieve the positive outcomes of co-production. However, the collaboration between professionals and citizens certainly leads to important changes in the working environment within public organizations, which can affect the engagement of professionals in co-production.

Given that co-production involves the use of innovative and non-traditional methods in the provision of public services, it can affect the role of professionals and create additional tasks for them. Accordingly, professionals may resist collaborating with citizens in co-production activities if they feel that their levels of autonomy have decreased within the work environment (Van Eijk and Steen, 2016). In education, and as our study focuses on citizens' perception, the resistance of professionals may be perceived by parents as uncooperative behavior. Consequently, parents may believe that the engagement of professionals does not necessarily enhance the effect of co-production on education quality, especially if parents organize and carry out co-production activities in schools without the assistance of professionals.

The interaction between professionals and citizens in co-production activities is crucial because citizens' involvement in the provision of public services puts pressure on both parties, often leading to conflicts. Pestoff (2012), for example, argues that co-production should be based on collaboration, negotiation, and communication to avoid conflicts. Similarly, Needham (2008) emphasizes that improving the quality of public services through co-production is only possible by strengthening the relationship between regular producers (professionals) and service users (citizens) and fostering trust between them.

The implementation of co-production should be based on effective mechanisms that unlock the potential knowledge of citizens. This generally makes the role of professionals more complex because there will be new functions or missions that may fall outside their expertise. Therefore, it is crucial for professionals to have the necessary skills to exploit this potential to the fullest (Osborne et al., 2018). Hence, the implementation of co-production may require real changes in recruitment, training and human resource management methods within public organizations (Nesta, 2011 in Bovaird and Löffler, 2012).

Based on our empirical findings and theoretical analyses drawn from the literature, we can conclude that the concept of co-production can lead to positive outcomes in terms of improving the quality of public services, particularly in the realm of education, which is the focus of our research. These findings hold significant implications for the planning and implementation of educational policies in Morocco aimed at fostering co-production practices and effectively facilitating collaboration between parents and school professionals.

However, co-production, being a multifaceted concept, cannot be regarded as a singular phenomenon in education due to the existence of various forms of co-production within school settings (Honingh et al., 2020). Therefore, empirical results concerning the impact of co-production on educational quality must be interpreted within the specific context of our study, which revolves around parents associations in Souss-Massa region in Morocco. Furthermore, co-production cannot be viewed as an all-encompassing solution to the deep-rooted issues in Moroccan education. Instead, it represents a component of a broader, multifaceted strategy needed to enhance service quality and outcomes.

On the other hand, citizen contribution and active engagement in the co-production of education are relatively recent phenomena even though parents' associations are among the oldest structures of co-production in Morocco. This shift has been driven by the expansion of mandates and responsibilities granted to these associations by public authorities in recent years. To achieve the full potential of co-production, it is crucial for public authorities to invest greater efforts in promoting co-production practices in education. This includes providing citizens with the necessary training, resources, and institutional support to ensure their contributions are both effective and impactful.

5. Conclusion

Co-production, as a concept that recognizes the importance of involving citizens in the provision of public services, is considered as an opportunity to promote social innovation and improve service quality. In education, empirical research has indicated that co-production activities, such as parent-teacher partnerships and community engagement in schools, can lead to improved educational outcomes. This is due in part to increased resource availability, shared knowledge, and enhanced support for students. Additionally, co-production fosters a sense of shared responsibility and commitment among stakeholders, leading to a more supportive learning environment.

Although research on co-production is expanding, the literature is dominated by single case studies, and there remains a necessity for additional empirical data and methodological diversity to effectively assess the outcomes of implementing the concept in public governance. To test empirically the assumptions about co-production, this study takes a different approach than most existing studies as we collected quantitative data and we used partial least square structural equation modeling method for analyzing the data gathered.

The study's findings indicate that co-production activities positively impact education quality, consistent with previous research using different methods. Data analysis revealed that there is a significant, positive relationship between co-production and education quality, which highlight the important role of co-production practices in improving educational services. However, the study found no significant moderating effect of professionals' engagement on the relationship between co-production and education quality. Although the engagement of professionals in co-production is recognized, by many researchers, as crucial for positive outcomes, the collaboration between professionals and citizens can be challenging because it influences the working environment within public organizations and can lead to resistance and low participation of professionals in co-production activities.

The diversity of co-production forms within educational settings underscores that co-production is not a uniform phenomenon in education. Consequently, empirical findings regarding the impact of co-production on educational quality necessitate interpretation within the particular context of the study, which is in our case parents' associations in Morocco. Moreover, it is to be admitted that the relationship between co-production and education quality is a complex one, as the concept is multifaceted and it is based on the collaboration between citizens and public professionals in shaping

educational services. Hence, the extent of this relationship can vary based on the level of engagement and the specific context of the educational setting. While co-production has the potential to positively impact education quality, further research is needed to explore the nuances of this relationship and the conditions under which it is most effective.

Although the positive outcomes of co-production and its potential to enhance service quality, its implementation poses significant challenges. Public authorities must carefully consider numerous factors, including the unique characteristics of public professionals, co-producers, and the service being co-produced. In addition, recent research highlights limitations and potential drawbacks associated with co-production. These include the risk of non-transparent practices, challenges in sustaining co-production initiatives over the long term, and the resource-intensive nature of implementation. Public authorities must remain vigilant to mitigate these risks and ensure that co-production efforts yield positive outcomes aligned with the goals of public service provision.

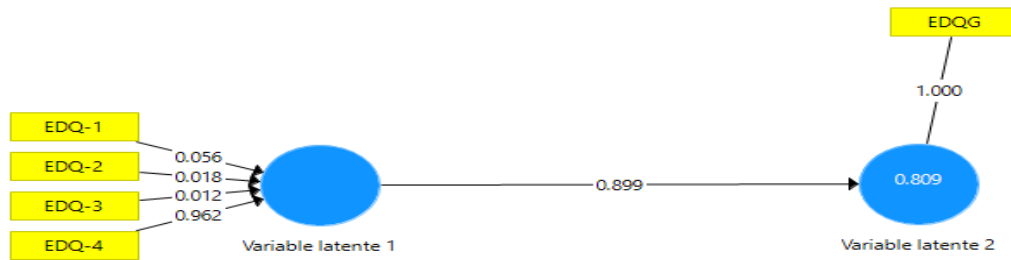
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APPENDIX

1. The redundancy analysis test



1. The explanatory power of the research model

	R ²	Adjusted R ²
Education quality	0.660	0.652

2. The predictive power of the research model

	SSO	SSE	Q ² (= 1-SSE/BSP)
Co-delivery	396.000	396.000	
Co-design	396.000	396.000	
Co-production	792.000	355.352	0.551
Education quality	528.000	329.513	0.376
Effet modérateur 1	132.000	132.000	
Engagement of professionals	396.000	396.000	

3. Blindfolding test

