


Article

Understanding Innovation in Education: A Service Co-Production Perspective

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Abstract: Innovation in education has been heavily focused on pedagogical, technological, or regulatory elements, while service innovation relates to other elements involving interpersonal and community co-production too. This paper provides a conceptual framework to understand innovation in education from a service economic perspective. This is done by bridging two rather disconnected research areas: service innovation and education innovation. The results indicate that (i) the characteristics of education as a service (such as interactive co-production) should be taken into account to better understand how innovations are created and implemented; (ii) innovation modes in education can be aligned with service innovation modes, mainly when a public service logic is adopted; (iii) the tension existing in service innovation between customization and standardization is replicated in the education sector; and (iv) multiagent frameworks in service innovation are particularly visible in innovative learning communities. Managerial and policy implications should be guided by service-friendly principles such as freedom, autonomy, and subsidiarity.

Keywords: education; services; innovation; co-production



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1. Introduction

Education and up-to-date skills are among the key socioeconomic challenges facing human societies in the 21st century (OECD 2014), along with others such as the fight against unemployment and social exclusion, the aging population, and health issues in pandemic times. New solutions and approaches are largely related to service innovations (Rubalcaba 2007; Rubalcaba et al. 2012; Gallouj et al. 2015). Education is a key research area, as it is a fundamental determinant of individual life chances and a major factor in economic and social welfare. In this context, innovation in education matters (e.g., Serdyukov 2017; Tarman 2016).

The need for innovation in education is justified by many factors. Human society evolves over time, so education cannot be stuck in the traditional ways of teaching. Education needs to address new societal challenges in the best possible way and promote higher quality standards. A particular challenge comes from globalization, which demands new skills and competencies, along with increasing competition among education centres (such as in the creation of world-class education) (Stewart 2012). ICT represents another major challenge, as well as the aging population and the need for life-long learning. In addition, education and skills are essential for inclusive, sustainable, and smart growth (Europe 2020 goals, European Commission 2010). Education policies are expected to promote education as a tool to increase employability and improve employment opportunities for all, particularly for at-risk groups. The enhancement of human capital is increasingly important, not only for economic competitiveness, but also as a means to avoid social exclusion and marginalization in the labour market. Innovation is particularly needed to deal with school failure and immigration. Finally, innovation in education is also needed from an economic point of view to increase its efficiency, productivity, and quality. Educational services have been considered as part of public services, which fall into the non-progressive, less

performance-oriented service sector in terms of productivity (Baumol 1967), with education as a paradigmatic example (Roza 2008; Hill and Roza 2010; Foray and Raffo 2012). The current budgetary constraints in many countries around the world also push the education sector to be more efficient and do more and better with lower or similar spending.

Education must not only be comprehensive, sustainable, and high quality, it must also be constantly evolving so that it responds to challenges and problems posed by the economy. This evolution must be systemic, consistent, and scalable, so it must be framed in an innovative system (Serdyukov 2017). For many, this is mainly related to the introduction of ICT and e-learning. Such policy-oriented scholars may refer to innovation as making changes in regulations, technology, competition, rules, and funding, which involve too much focus on external factors (pedagogical techniques, ICT, and regulations).

However, the fact that education is a service cannot be taken for granted. A service view of innovation in education should include the interpersonal and communitarian aspects often missing in that narrow view of education innovation: real innovation in education can derive from a new dynamism in human and social interactions, a new dynamism able to motivate individual freedom and social arrangements. There is surely more radical and important innovation in the new ways groups of teachers deal with and look at student problems than the mere introduction of new pedagogical techniques or new technologies. Consequently, innovation in education will be immensely more successful if the lessons learned from innovation models and examples are applied in the whole educational system and not only the pedagogy dimension (Baumann et al. 2016). Having the correct service solution to a student's problem could have more of an effect on their character building than having technological innovations on board. Real innovation in education is not possible without motivating freedom (understood as the capacity to act and interact beyond legal requirements), because education is a service co-produced among people: better in active co-production (from active freedom) than passive co-production (from passive freedom).

The importance of this new way to approach innovation in education can also be seen by considering the Finnish paradox (OECD 2009c). Finland is a top country in terms of student attainment but is not a particularly innovative country according to some parameters: teaching is rather traditional (not much new technique or ICT) and regulations are not very innovative (the system is almost full public schooling). However, if Finland is considered based on human interactions, we can observe how this country is in fact very innovative. A system customized to the needs of children, for example, and well-known innovative characteristics make Finland different from most other countries. Therefore, innovation requires a comprehensive approach based on human and social interactions.

The problem comes when innovation in education neglects the service aspect and human and social interactions and only focuses on pedagogy, technology, or regulations, which could lead to misconceptions and bad practices in education management and policy (contrary to the success of Finland). This is why this paper has relevance: it approaches innovation in education from a full-service perspective. The objective is to understand the nature, characteristics, and impacts of service innovation in educational services, and the way they are created and implemented.

From this scope, the paper has two goals:

- (i) To build a conceptual framework for innovation in education, building on the service view;
- (ii) To bring together two disconnected strands of the literature: education innovation and service innovation.

From these goals, we can elaborate some research questions: How can we identify service innovation in education? Which is the right conceptual framework based on both the education innovation and service innovation literature? How can service innovation improve educational systems? How do different actors participate in innovation processes? To approach these questions, we build the paper around four research hypotheses:

Hypothesis 1 (H1). *The characteristics of education as a service (such as co-production and interaction) should be taken into account to better understand how innovations can be created and implemented.*

This hypothesis is based on the Lancasterian model, in which service innovation builds on new or improved service characteristics (Gallouj and Weinstein 1997; Gallouj 2002), and on the fact that education is a service, not a product, so personal endowments, skills and motivations are essential, from teachers and students in particular (Lambriex-Schmitz et al. 2020) as well as co-production from primary school (Honinigh et al. 2020) to university (Ng and Forbes 2009).

Hypothesis 2 (H2). *Innovation models in education can be aligned with service innovation modes, mainly when a public service logic is adopted.*

This hypothesis is based on the possibility that the categories and modes of education innovation (OECD 2009a, 2014; Lubienski 2009) can be revisited considering the new (public) service logic (Dean et al. 2016; Osborne 2018, 2020), which is differentiated from new public management in the way services are placed at the core of public value creation. Service innovation and education innovation modes can be aligned when both are oriented to public value.

Hypothesis 3 (H3). *Existing service innovation between customization and standardization is replicated in the education sector.*

This hypothesis builds on service innovation trends (Gallouj et al. 2015) and their applicability in the education sector, which has already been proved to be relevant to gain sustainable comparative advantages in higher education (Boon et al. 2020), and may contribute to a better understanding (Vincent-Lancrin 2017).

Hypothesis 4 (H4). *Multiagent frameworks in service innovation are particularly visible in the role of innovative learning communities.*

This hypothesis establishes that the multi-agent frameworks analysed in service innovation research (Gallouj and Weinstein 1997; Windrum and García-Goñi 2008; Windrum et al. 2016) are also useful to understand education innovation, as has been partly done in analysing co-creation in higher education (Dollinger et al. 2018), family–school partnerships (Willemse et al. 2016) or the role of learning communities in schools (OECD 2009b; Schaap and Bruijn 2018).

Figure 1 shows the research approach of this paper. The four hypotheses are the four pillars for building a bridge between the education innovation and service innovation literature, rooted in the concept of education as a service and, thus, education innovation as service innovation.

This is a conceptual paper, so its methodology is not to conduct an analysis directly supported by data or case studies, but to review the literature and theoretical developments. The selection of the literature was from recognized works in both the education innovation and service innovation literature. It covers all education levels, from primary to university, but not all developments, and results will be equally valid for every level. Further research may address differentiation by educational level.

After this introduction, the structure of the paper follows a double rationale. First, it investigates each of the four areas related to the four hypotheses, so there are four sections. Second, the order of the sections is not random. Section 2 is related to H1 and sets up the basis of the paper by defining education as a service. Section 3 focuses on service innovation in education modes, and H2 derives from extending the definitional work. Section 4 deals with H3 and presents the service innovation trends in education. Building on those three sections, the final section develops the analytical framework, with a focus on

the role of innovation learning communities. We conclude with some final remarks and policy implications.

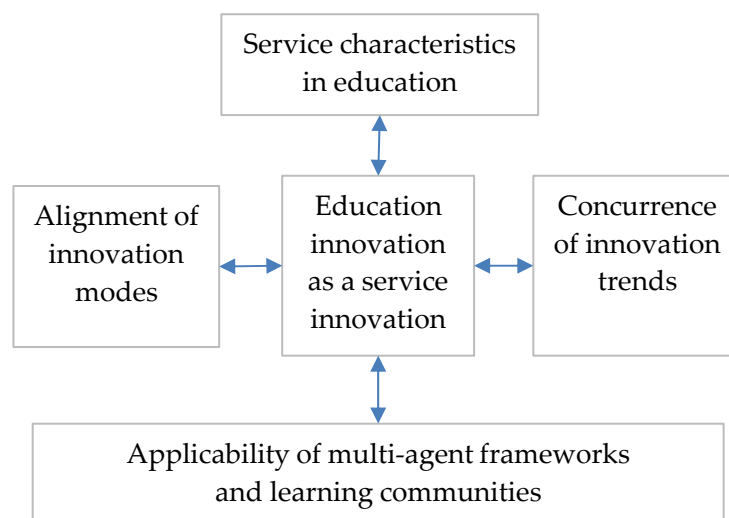


Figure 1. Research approach.

2. Education as a Service and Service Innovation in Education

Many definitions of education are built around the concept of instruction or knowledge. The Oxford Dictionary defines education as “the process of receiving or giving systematic instruction, especially at a school or university”. It also means “the theory and practice of teaching”, “a body of knowledge acquired while being educated”, and “information about or training in a particular subject”. Other definitions of education, such as the one at [dictionary.com](https://www.dictionary.com) (accessed on 10 January 2022), place more emphasis on the knowledge part gaining the skills for a mature life: “the act or process of imparting or acquiring general knowledge, developing the powers of reasoning and judgment, and generally of preparing oneself or others intellectually for mature life”, while education is also considered as “the act or process of imparting or acquiring particular knowledge or skills, as for a profession”, “a degree, level, or kind of schooling”, “the result produced by instruction, training, or study”, or “the science or art of teaching; pedagogics”. From an economic perspective, education is often perceived as a way to increase human capital (Becker 1993) by which public administrators should guarantee the freedom of individuals and parents to choose (Friedman 1955). Economists also recognize education as part of the public service sector, since it has some characteristic of public good, so public administrators have to intervene to correct market failure and cover what private education cannot cover. In all of these ways of defining education, it is surprising that it is rarely described as a service.

It is surprising that the definitions of education do not focus on the nature of what education is: a service provided by some agents (parents, teachers, schools, universities, etc.) to others (students, children, adult learners). From the etymology, education comes from the Latin “educare”, which means to breed, bring up, rear. This presumes the existence of a social context in which some persons help others to attain education. Some take on the role of “servus”, the Latin root of the word “service”, for those who deserve such learning. This is why education is a vocational career for many; beyond any economic or monetary interest, many people work in education as a way to serve others and society as a whole. Education is a service, surely one of the most important ones in society.

Education, like any service, requires a certain level of co-production. A service is a co-produced activity in which the main outcome is intangible (a service is not a good, even if it can be integrated with goods or offered through physical means). A service is about people. Educational services are about learning processes and knowledge transfer between people, not between systems or productive processes.

Centering education around people and service is justified by the fact that education cannot be restricted to instruction or training. [Giussani \(1995, 2019\)](#) defined education as an introduction to reality through communication of one's own rationale and experience. One person or a group of people communicate to another or others their capacity and rationality to understand reality. Those receiving education can better understand themselves and their external reality after the educational process. This is why education is about a relationship, not only about instruction or institutional factors. Education is a relationship with a learning process woven in.

This focus on education as a co-produced service reveals the centre of freedom in education. No education is possible if one of the parties is not engaged in the co-production. A passive attitude from the teacher, the student, or both would never lead to high-quality results. Freedom has to be motivated for engagement and key actors cannot be replaced for this.

Human relationships lead to social and community interactions: between teachers and students, between masters and disciples, between families and schools, between teachers and parents, between students, etc. The social atmosphere in a learning community is essential, even in homeschooling (families, friends, or other homeschoolers play a key social role in this type of education). Education is not a commodity, like a good that can be sold and bought in a store. It needs co-production, collaboration, and co-creation ([Honigh et al. 2020](#); [Lambriex-Schmitz et al. 2020](#)).

Moreover, the reasons for schooling failure (early abandonment or bad performance) are often related to lack of engagement of students, teachers, and parents with education, or not being strong enough to face the common mentality in society and deal with the effects of negative influences from peers ([Steinberg 1997](#)). This is because any teaching has a moral dimension ([Wynne and Ryan 1993](#)), so for many, not only students, failure in education is a moral failure to some extent. However, the paradox here is that moral and right attitudes cannot be imposed on children, parents, or teachers. The good has to be embraced and desired. The role of community comes in again here. Communities can make good education attractive so that everybody can participate in a natural way. Those who hate studying may embrace it because they can see its attractiveness through others, showing them how good it is. This phenomenon of osmosis is essential in education ([Giussani 1995, 2019](#)).

The recent contributions *Public Services Logic* ([Osborne 2020](#)) and, before that, *Service-Dominant Logic* ([Vargo and Lusch 2004](#)) stress the role of service at the centre of co-production oriented to value creation, particularly public value. Education can also be understood in terms of service logic ([Ng and Forbes 2009](#); [Dean et al. 2016](#); [Ford et al. 2008](#)).

3. Modes of Service Innovation in Education

Innovation in education has been researched for quite a long time. The work of Miles from six decades ago ([Miles 1964](#)) is a good example. He defined innovation as a deliberate, novel, specific change (p. 14), and defined diverse innovation areas such as boundary maintenance operations, size and territory, physical facilities, time use, goals, procedures, role definition, normative beliefs, structure, and linkages with other systems. It is interesting to note that some of these areas are rather neglected nowadays in the ways innovation is conceived: goals and normative beliefs are often considered out of the picture, and the size and territorial aspects out of innovation mode, while pointing out interesting aspects that should not be forgotten.

For [Looney \(2009\)](#), innovation in education is mainly related to innovation in processes (methods, practices, and organisation) and includes new or significantly improved approaches to classroom-based teaching, learning, and assessment, as well as changes in the organisation, or governance, of systems. She considers that innovation in education is mainly related to teaching, learning, and assessment. The development of cognitive skills for thinking and reasoning and learning to learn and the capacity to synthesise knowledge across the curriculum are emphasised in a context in which teachers and students can tailor

programs according to the needs and interests of individual students (OECD Teaching and Learning, International Survey). For [Foray and Raffo \(2012\)](#), educational innovation is the art of creating and disseminating new educational tools, as well as new instructional, organisational, or technological practices; their approach also addresses the issue of patents, so innovation often is considered as formed out of school, mainly in science and pedagogy.

Table 1 offers a summary of innovation modes in education, comparing the standard definition of each type according to the [Oslo Manual \(2005\)](#), the application in education by OECD, the additional focus by Lubiensky in his 2009 review, and the additions that can be made from a service innovation perspective. The revised 2018 version of the Oslo Manual ([Oslo Manual 2018](#)) is not used here, as it is much more oriented to business companies, while the 2017 manual is more suitable for education.

Table 1. Innovation modes in education from a service perspective.

Innovation Types (OSLO 2005 Manual)	Standard Official Definitions (Oslo Manual)	Application in Education (OECD, 2008, 2009)	Additions-Focus by the Lubienski Work in 2009	Additions-Focus an Educational Service Perspective
Products innovations	New or significantly improved good or service	Curriculum Educational software	Differentiated curriculum	Value added services Mix of schooling and extra-schooling activities Recombination or fragmentation innovation
Process innovations	Production or delivery methods and changes in techniques or equipment	New and improved methodology New ICT use and e-learning	Child-centred teaching, Montessori-like methods, Stainer-Waldorf, back-to basics traditional	New ICT oriented service methods Distant e-service New pedagogy or learning techniques
Organisational innovations	New organisational methods or external relations	New organisation of work between teachers, or organisational change in administration New ICT interfaces	Competition and school choice (quasi-market conditions)	New ways of interactions between teachers and students and between schools, parents and other stakeholders.
Marketing innovations	Product design, packaging, promoting or pricing	Pricing and admission strategies	Promotional activities, top-up pricing Control of admissions Possibility of deny admissions	Co-creation of education value Service dominant logic Co-innovation

Most aspects in the table are well established in the education literature; for example, pedagogy, assessment, and markets for innovation. In pedagogy, innovation can be promoted by just extending well-known innovative practices that are not present in a given locality, which is what happens when, for example, the Montessori approach is exported from one place to another. In education, as in any other business or service, there is a need to distinguish between innovations new to the firm/school/institution and those new to the market/world. Most of the work on innovation in education relates to areas such as teaching methods, assessment, skill programs, curriculum integration, or cooperative learning ([Ellis 2005](#)). A study by [van den Broek and Espin \(2012\)](#) provides a good summary of innovative approaches to learning and teaching, mainly from a constructivist perspective. In that work, a number of key innovative concepts are explored: fostering communities of learning, learning by design, central conceptual structures, web-based science environment, cognitive tutors, ACT-R theory and director instruction, higher-order thinking skills, and knowledge building. Some of them, such as knowledge building, are oriented towards creating knowledge communities, so they are social in nature to a large extent. Another example is provided by [Beck and Kosnik \(2006\)](#), who present social constructivism as a continuation of individual constructiveness; the social aspect is more community-oriented, with learning produced in a holistic way and students engaged in the construction of knowledge and acquiring the habits to become life-long learners.

Most of the pedagogical technique-based innovation refers to teaching and learning innovations generally characterised as being “student-centred” or “constructivist”. The anti-constructive movement would defend that innovation is intended to get rid of the bad innovations fostered by that movement and go back to the traditional way of teaching based on the intensive and serious transmission of content (Hirsch 1999). Going back to tradition would be the key “innovation” according to this school of thought, although it does not exclude other types of pedagogical innovations to improve the traditional mainstream instruction.

Regarding curriculum, comparing different OECD countries, Kärkkäinen (2012) deeply explored the role of curriculum in innovation, proving the importance of a decentralised curriculum to promote innovations that can spread through horizontal networks of schools and teachers, although some elements can reduce the innovation power of the centralised curriculum and the innovative flexibility of the decentralised curriculum.

Regarding assessment, a study by Looney (2009) on OECD countries suggests the need to combine innovation with an adequate assessment system. This report shows that high-stakes assessments and examinations undermine innovation, and the goals of innovative programs are misleading if teaching is reduced to exams. Innovative programs require innovative assessment that does not create anxiety or discouragement, in particular in underachieving students.

Markets for innovation can be considered as a true instrument of innovation. This is clearly the case for charter schools in the US and Canada, considered to be “research and development” centres for innovation targeted to different and innovative teaching methods (Lubienski 2009), even if existing studies show that they are not so much innovation laboratories for new educational practices, “but showrooms or greenhouses where different educational practices can be made available to different communities and perhaps nurtures in different contexts” (p. 36). Their innovations have more to do with marketing and organisation than products and processes.

The service innovation perspective focuses on value-added services, such as new after-school activities being promoted and linked to the main curriculum (product innovation); new value-added technologies, such as services promoted and offered through online systems (process innovation); new ways of interacting between community members, agents or stakeholders (organisational innovation); and a new management and marketing orientation towards a service-dominant logic (Vargo and Lusch 2008) with co-creation of value and co-innovation. This latter aspect is very important, as a large amount of emerging literature is devoted to explaining how marketing and management can be oriented towards service innovation, and the literature on educational issues largely ignores this parallel development.

4. Innovation Trends and Tension in Education Services

All services exist within a tension between pure behaviour as goods and pure behaviour as service (Rubalcaba 2007, 2018), including educational services. This tension can be illustrated in a threefold way: tension between repetition and personalisation, between bipolar and multipolar, and between security and risk.

The tension between repetition and personalisation comes from the different needs, supply, and demand when co-production is offered. Educational institutions try to repeat certain service standards in order to pursue a different set of advantages; standards help to differentiate and build a brand name, to simplify the problem so that everything follows the same rules, and to reduce the costs of information and time. Educational services, as any other public or private service, compete to offer standard services at relatively low or lower cost. On the supplier side, many customers want precisely the opposite: personalisation beyond the standard. Schools where students can receive personal follow-up and attention are desired by many families. An extreme trend in this direction is homeschooling, where full personalisation is given by parents and tutors with no schooling standards at all. Standardisation is often the preferred option for managers, principals, and policy-makers,

who want to simplify and reduce the complexity of their problems, on the one hand, and to justify their position by adding commonalities and new regulations as if this was part of their job, on the other. Personalisation means more complex problems and more delegation of responsibility to staff and teachers. Tension also exists among teaching staff when deciding, for example, whether to ask for standard assignments or to allow more variety to adapt assignments to different student profiles and interests.

Tension between bipolar and multipolar. The consumption of goods is often bipolar between a provider (maker and/or seller) and a customer (individual or firm). Service production and consumption can also be bipolar (e.g., tutoring between a teacher and a student), but it often goes takes on a multipolar context when other agents interact. This is due to the growing complexity of service co-production. The growing complexity of service relationships introduces the idea of covalence, as [Barcet \(1991, p. 64\)](#) describes: "This notion is used in chemistry to point out the connections which are made between atoms (or between ions) in order to obtain a combination or a chain whose value is determined by the different elements, knowing that, independent of their nature, each one has an essential place". From this idea, Barcet first deduced that a service is obtained through a combination of different acts.

Another fundamental aspect of covalence is that the nature of the service changes when faced with a change in one of its areas. Interactions between agents define a system of relationships that changes in nature with the incorporation of new elements in the system. This is a natural consequence of covalence: supply and demand constitute a double-linked service within an environment or system from which co-production emerges, whose nature changes when faced with the introduction of any new element. In education, this means that the relationship between teachers and students, for example, can change in nature when other parts are involved. The move in innovation from bilateral to multiagent innovation mode changes the nature of innovation, which can make the system become more complex and risky. However, a change towards a more multiagent environment is also a change towards more learning communities engaging in the educational process more in a social environment and less dependent on the capabilities of a particular teacher. In this sense, what may initially be more risky and complex can become a more secure and valuable strategy (e.g., the risk of bad consequences of hiring a bad teacher are reduced in living learning communities where some good teachers and staff make up for the deficits of others).

In terms of the tension between security and risk, risk perception, fruit of the co-productive and covalent character of services, differs from the case of goods. When goods are purchased, the inherent risk in the quality of the product is reduced by the presence of guarantees, endorsements, standards, repair services, and insurance. In some businesses, a simple statement from the client on defects perceived in the goods purchased is enough to exchange the goods or return the money. The process is not the same in services. First, the risk connected to purchasing a service does not have as many mechanisms for risk reduction. A service cannot be returned, as it is consumed during production, and is not an object available for sale or return. On the other hand, services have a process of endorsements, standards, and accreditation that goes much further than the similar process for goods. This is particularly true in the case of education, despite the assessment and accountability aim of introducing the notion of security and helping to reduce risk. However, assessments may often undermine innovation ([Looney 2009](#)), so systems are forced to assume pro-innovation risks, as in the case of US charter schools ([Lubienski 2009](#)).

Figure 2 shows some educational areas and practices according to the two first types of tension described. Educational systems and institutions can promote a more customized or more standardised education, or a more multipolar community or more individual bilateral framework. Not all educational areas have a single location in the picture. For example, the promotion of more autonomy for teachers, as in Finland, where they only have to follow certain guidelines, is certainly a way to potentially maximize customization to the needs of the class. However, this may not necessarily be the case, and some teachers

may promote a more community-oriented education (reinforcing teamwork), while others promote exactly the opposite by encouraging only individual effort. Moreover, each of the actions and areas proposed can have room to go more into the customized social area or the standard individualistic approach. The same applies to the use of technology, since some digital learning can be customized very little (teacher-led courses) while others can be extensively customized, as in student-centric learning (Christensen and Eyring 2011), the latter representing an innovative and disruptive model.

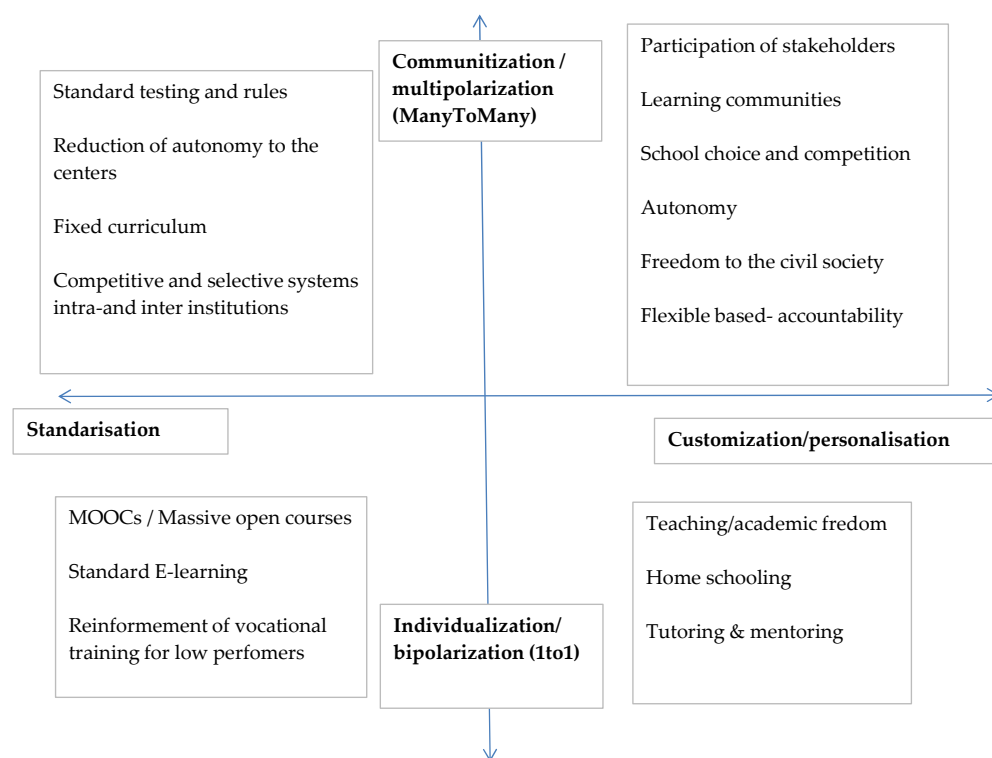


Figure 2. Innovation trends and tensions in education: communitization vs. individualization and customization vs. standardization.

Figure 2 also represents the service dominant logic that can be applied to education: services tend to be more co-productive, interactive, and multi-agent than goods, and to be more customized than goods. The choice between customization and standardization is to some extent a choice between dealing with educational as a service, as a result of the learning or as a commodity that can be standardized and sold on the market or in political debate. This context is also useful to understand OECD works (Istance and Kools 2013), defining innovative learning environments in the path from traditional education to contemporary education that is more pro-innovation and pro-customization. They suggest the need for a new individual and social balance, since traditional schooling was defined by a particular combination of social and individual characteristics: “i, Unindividualised ‘one-size-fits-all’—a shared learning programme where the notion of personalisation has little place, and ii, Social in the domination of whole-class teaching (without collaboration with other learners or educators)”. The learning environments examined through the OECD-ILE project have “deliberately sought to rethink the stereotypical social and individual roles in ways that are very relevant to the role of technology. The OECD is defining a move towards the bottom-left quarter of our figure to the upper-right quarter. However, it is paradoxical that some of the most technologically-based innovations in education, such as massive e-learning courses, are the result of intensively standardized teaching (valid for thousands of students) and very individualized teaching as well (online with no face-to-face interactions at all). Therefore, some new trends in education are not along the line of creating innovative learning environments from a community perspective.

The community perspective in education is aligned with a participatory approach to educational services and customization-related innovations. In the relationship between a teacher and a student, the most important relationship in education, interaction is the key to delivering high-quality service. A teacher and a student share the same humanity, desire, and heart, so there is the basis to start a fruitful relationship and start building a learning community. What is hidden in each of the parts is more important and dynamic than what is revealed in a certain moment. The process of education is a process of discovering reality and at the same time one's own humanity. Being open to the other (teacher, student) and expressing mutual interest are essential for a real co-production experience in education. When this is not done, only instruction and training are left, not real education, nor a real co-produced service. What is valid for a personal teacher–student relationship is also valid for the full set of agents participating in education. Co-production in education involves true participation: the parents are needed for smooth teacher–student relationships, policy-makers are needed for smooth relationships between schools, and so on. Each one may have a place in participatory logic.

Education is therefore a service in which a participatory logic prevails, even if a high degree of standardization would reduce the level of co-production. Real education will always require a certain level of customization and co-production. Moreover, the social component in education is often recognized, and has anthropological roots. Successful education cannot be achieved without the right family and cultural environment. A bad family or cultural climate could be an obstacle to education. This is because a person is never in isolation, but is a member of society, participating in society.

The deeper the awareness of the importance of education in society, the greater the desire to educate not only on cognitive skills but behavioural social skills also. The role of society in the act of educating is therefore both at the origin of education (we are all social beings) and at the end (we need education to be, live, and work in society).

The service and participatory logic in education may lead to concrete good and bad practices. Table 2 shows some examples of these. Bad practices do not take into account the service dimension of education, while good practices do. Service innovation is necessary to convert the typical common bad practices in education into good ones. This can be done by looking at the service nature of education. For example, if education is perceived as a service and not a commodity, the reduction of education to instruction makes no sense. Services are about human beings and human processes, not about products that can be transferred mechanically. Students and parents form the demand for services that require participation in the process in a very interactive way. Moreover, with services, the higher the quality of the interactions, the higher the service quality will be. Customization is another dimension of quality in knowledge-intensive services. Customization involves taking into account the individual needs of students, not only cognitive but also behavioural and affective, the three dimensions building character at school (Seider 2012). Adaptation should be a normal practice for everybody to get the most out of each student. This would serve all students, but obviously more those with special educational needs. This is supported by the fact that education is not only about cognition and the different levels and speeds of cognitive processes, but about behaviours and emotions essential to building a well-educated character, the outcome of personalized service.

From this service perspective, the assessment should also take into account the multi-dimensional process of education, so not only cognitive skills should be promoted; marks can be part of an educational instrument to teach good and bad student behaviour. With services, motivation is essential, and assessment is a key instrument for motivating and incentivizing a culture of effort. In some schools, effort (e.g., though homework, observation or tutoring) is considered part of the marks as an essential educational instrument, while other schools reduce the marks to just the results of content learning and proving knowledge on tests, limiting the service dimension to just the valorisation of intellectual instruction. Finally, in the service context, interactions are important, among both suppliers (teachers and teachers, teachers and principal) and clients (parents and students) and,

of course, suppliers and clients (the role of students and parents is essential in school life). A service culture often generates “secondary services” associated with the main one, increasing the value-added concept. In education, we can talk about value-added services in terms of after-school activities, for example.

Table 2. Examples of service co-production practices in education.

<i>Area</i>	<i>Service Component</i>	<i>Non-Service Friendly Practice</i>	<i>Service Co-Productive Practice</i>
<i>Teaching</i>	Education is a service between human beings, not a cognitive commodity	Teaching as just transmission and instruction	Focus on integral education, not only cognitive transmission. Soft skills and affection are integrated
<i>Students</i>	A service is coproduced. A high quality service require high interactions	Passive recipients of knowledge	Active co-actors in the education process and teaching
<i>Assessment</i>	Instrument to promote all character dimensions (cognitive, behaviour, affection) to get a true student engagement	Purely based on cognitive availability at the tests or exams	Based on a full continuous evolution of the students and their education in an integral way
<i>Students with learning difficulties</i>	Service customisation is needed in integrate all students in the education process	Just the responsibility of the specialists and support teachers	Integrated in the common path with special attention and adaptations
<i>Inter-teachers relationships</i>	Teachers as partner in the service coproduction	Competition and minimum coordination	Sharing and common live. Collaborative culture
<i>Parents</i>	Client-driven services means parents-driven service in education	Efforts to minimize the “bothering” from the parents	Efforts to engage parents in education at different levels
<i>After school activities</i>	Value added services added to the basic services	Mechanism to fund raising and keep the kids busy	Ways to enlarge and teach the educative goals of the centre

5. Framework and the Role of Innovative Learning Communities

The previous discussion on innovation modes allows us to place service innovation in education in the right framework, as shown in Figure 3. This can be driven by societal challenges in the area of education, such as quality, labour market fit, social inclusion, scholar failure, life-long learning, global knowledge, e-learning, etc. Adopting service innovation in education should be the way to face to these challenges and lead to a final better performance in terms of socioeconomic growth and welfare.

The essential drivers for these innovations are the resources or inputs, mainly human resources: teachers, staff, principals, and managers. In addition, the science of and progress in pedagogy and educational issues can be considered as separate input, since it can or cannot be merged in the human capital. Finally, capital and technology are also important (e.g., digital learning resources analysed as systemic innovation in the Nordic countries (OECD 2009c), or all changes in education related to technology, which some call the digital revolution in learning (Collins and Halverson 2009)), although relatively less than in other economic activities. As in most services, the human aspect is key for innovation. If

innovation is produced, it is because there are innovators, or what some call educational entrepreneurs (Hess 2006).

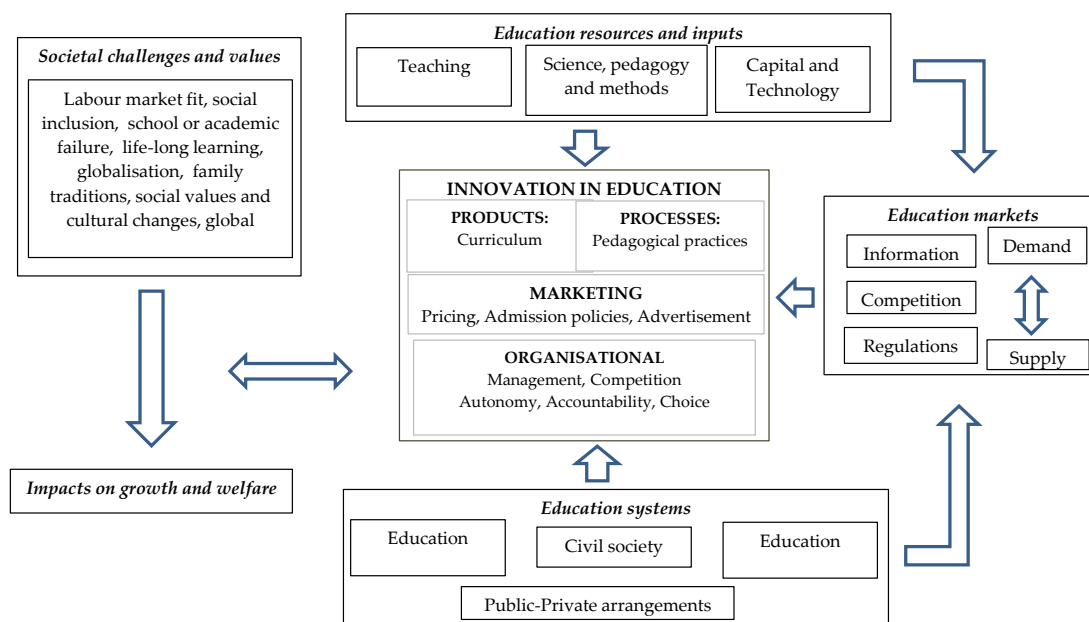


Figure 3. Framework for service innovation in education.

On top of resources, another major source of innovation is reforms and changes in the educational market. Promoting competition and school choice is in itself an innovation (organisational innovation), and the market dynamics can be another powerful source of innovation.

Finally, the educational systems, the pillars (such as families and civil society), and policy-makers also play essential roles in driving innovation in education. Without them, the individual resources, teachers, and technology could not flourish. Public–private interactions and arrangements may have a role in this area as well.

A particular observation on the impact side of innovation is important to mention. As pointed by Lubienski (2009), there is no clear evidence that many of the innovations or quasi-market conditions (competition, school choice) improve the level and quality of schools. Even more, even quasi-market conditions do not always bring innovation; sometimes they bring back traditional ways of teaching, as in some charter schools in the US, where innovation is often curtailed by mechanisms created by the reformers.

This does not mean that quasi-market conditions do not affect innovation or that innovation does not affect the quality of educational, for two reasons: (1) The relationship between innovative measures and performance requires particular and detailed analyses, as done by Woessmann et al. (2009), who reported some relationships between the level of student achievement and different facets of autonomy, accountability, and choice. Certain positive associations are found, but not in all cases and all conditions (e.g., privately operated schools performed better only where there was autonomy and external accountability, and greater hiring autonomy is good for student achievement, while this is not the case with higher budget autonomy, mainly if there is no external control). (2) The studies summarised by Lubienski measured educational performance mainly in academic and cognitive terms (e.g., PISA results). However, many quasi-market conditions or innovation outputs do not have a direct effect on students' academic performance, but on other positive outputs, such as parents' freedom to choose the education they want, efficiency in the use of resources, and the cohesion principle in education or the welfare and happiness of students. All of these key educational goals are not reported in studies concluding a lack of clear effects of innovation. Therefore, the aspect of educational goals matters when talking about innovation performance, as we will report later.

This framework must be complemented by a view of who is designing and implementing innovation in educational services. Interactive co-productions happen between agents that collaborate or co-create new or improved services (e.g., [Armstrong et al. 2021](#); [Honingh et al. 2020](#)), which is aligned with the concept of smart education ([Visvizi et al. 2018](#)). This happens through what we can call “innovation learning communities”. This refers to communities of teachers, teachers and families, and teachers and parents open to the society. The OECD concept of environment in education can be useful to describe the role of technology, gathering different realities and individuals. However, the community concept refers to something that is not included in the environment idea. The etymological root of “community” is the Latin “*communitatem*”, which “was merely a noun of quality . . . meaning fellowship, community of relations or feelings”. An Old English word for community was “*gemænscipe*”, which means “community, fellowship, union, common ownership” (etymology online). Other related words are society, fellowship, friendly intercourse, courtesy, condescension, and affability. A community is therefore related to something held in common (common ownership) for which people group together (fellowship). This means interactions prevail and face-to-face encounters matter, even if they are not considered a daily obligation, and members of an educational community can meet a few times or even not at all in physical terms, because ICT can replace the need for many face-to-face on site meetings. However, a minimum amount of face-to-face is always needed in a community.

[Wynne and Ryan \(1993\)](#) underlined teaching as moral education and defined some characteristics of communities: a community is a bounded environment, persisting over time, among people who share important common goals and cooperate with one another to attain their goals; people can belong to large communities and subcommunities in vital communities. This is useful to understand that the problem of disengagement of young people and associating with problematic groups outside the school is partly related to the weak influence of school and parent engagement. Positive groups can influence youngsters to attain higher academic achievements even in cases where they come from families with less education (as reported for Asian students by [Steinberg \(1997\)](#)). Highly educated parents may see their children score worse if they are attracted to peers who avoid studying. It is important to build character in a given community where parents and schools (and many times outside institutions such as churches) are aligned in the same direction. This community life can sometimes be presented as a family–school partnership ([Willemse et al. 2016](#)). A community oriented towards educating for strong character (cognition, behaviour, and emotions ([Seider 2012](#); [Scott et al. 2014](#))) can only be a successful learning community.

Given this concept of community, innovative learning communities are those that can reinforce mutual learning and are continuously open to change and improvement. An innovative learning community may have the following characteristics:

- Common end. The community has a common end justifying their being together. The end of education is the end of a particular community at school, university, or any educational entity.
- Common ownership. All members feel that they are owners of their education. From this ownership feeling there is a responsibility for the common end. This may be more possible at private schools and universities, where families and students pay expensive tuition fees, which may make them feel a stronger sense of ownership, than at public schools, although in some countries, such as Finland, ownership at a public school can be similar to that at a private school.
- Sharing. The collective goal should involve sharing among the different agents to achieve it. In this way, individual innovations are called upon to be shared and de-privatised for the benefit of the collective.
- Openness. A dynamic innovative community is always looking to make improvements, so it should, by definition, be open to profit from innovations coming from inside and outside the community.

- **Companionship self-awareness.** In a dynamic and innovative educational community, a company’s self-awareness is needed. A teacher does not think of him/herself out of that community to which he/she belongs to. There is a linkage between the good for that communities (students, parents, and other colleagues) and the good for himself/herself. It is really companion of people with the same wishes and needs at the base of the daily work. With high community self-awareness there is little room for individualist behaviour or free-riders.
- **Authority.** In a community, not everybody has the same power or the same authority. A community is not a democratic assembly in which individuals have the same rights. As in most institutions (e.g., families, enterprises, churches), some members provide guidance and make decisions. The concept of authority not only applies in terms of power and decision-making; it also refers to the real power the guidance of the community has on its members (mainly students). Teachers having authority over students is also the way students are engaged in a healthy way with their teachers. Students can follow the teachers in whom they perceive something like disciples see in their masters, as far as they are great authorities who deserve to be followed. This is the real authority.
- **Leadership.** Related to authority, the innovative dynamics within a community highly relies on school leadership, which is particularly important to enhance the quality and intensity of instruction, the closeness of student–teacher relationships, and the rigor of instructional content for all students (Gaynor 2012).

Educational organisations are extensions of families that take on the role of education within community life. When this does not exist, education is often restricted to training or instruction, the transmission of knowledge from some individuals (teachers) to others (students).

Figure 4 shows the idea of innovative learning communities from a service perspective, where service co-production is the result of community-oriented work, in a community where different groups can live and interact, mainly a community of teachers inside a wider community of parents and students. Interactions with other networks or communities are expected too.

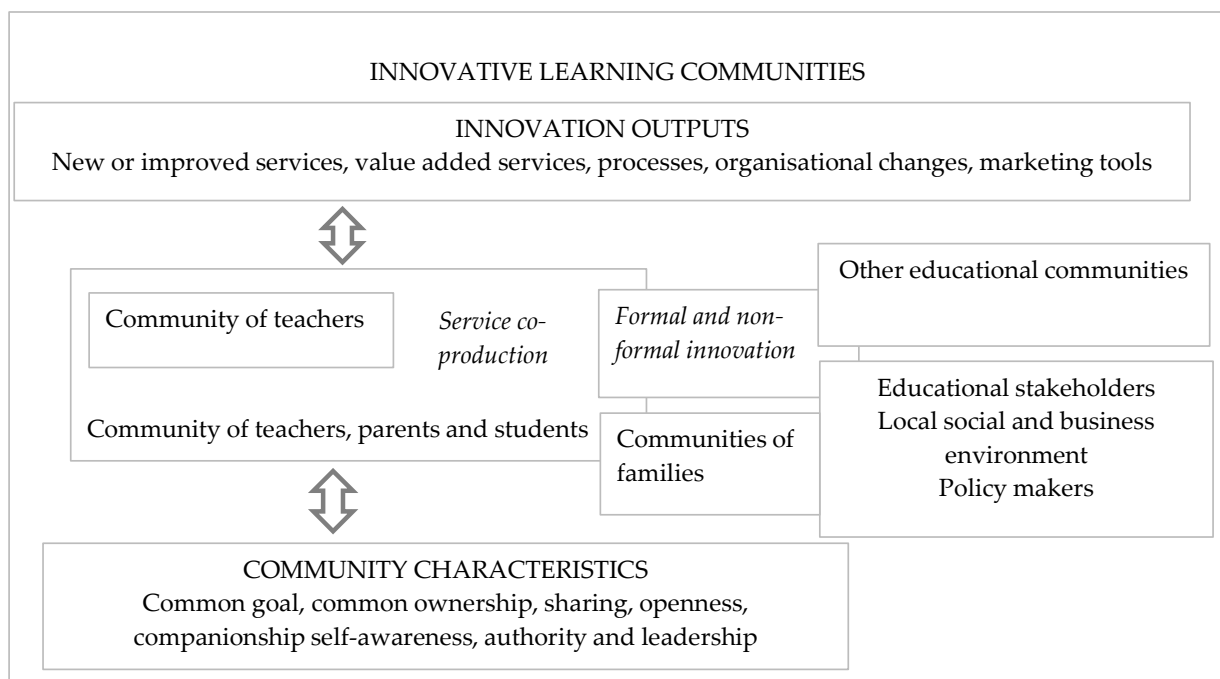


Figure 4. Innovative learning communities.

The importance of community can also be seen in the homeschooling phenomenon. Homeschooling is not against the idea of education communities but is for the idea of integrating education in a very strong community according to family values and teaching that is fully adapted to the level and capability of students. Homeschooling is a return to domestic education (Gaither 2008) that at the same time is open to alternative ways of socialising (groups of homeschoolers, teachers pooling their efforts, joint after-school activities, mixed homeschooling and school programs).

An additional remark can be made about the relationship between freedom and community. A possible criticism of the community concept is that education is mainly about forming individual character based on the teaching of individual teachers. In previous sections we stated that this individualistic approach to education may have a place under individualistic goals. However, a social perspective on education leads to a different view, in which the community dimension is an essential part. Moreover, any educational process will take place within a particular social context. There is no education outside of the real social world.

Education is a service by which individuals exercise their freedom to build character and improve their understanding of reality and life. However, exercising individual freedom does not contradict the communitarian dimension. Individual freedom takes place within a particular social environment. The communitarian approach can be useful to encourage individual freedom and build strong character. The cognitive growth, behavioural path, and happiness of individual students can be better facilitated when they participate in communities in which this dynamism is happening. The experience of others and the attractiveness of what others are doing can be the most effective motivation to move individual freedom towards an integrally educated character. When education is not considered instruction or training, but an integral learning process, community matters. The community is often proposed as the atmosphere that makes character building possible.

6. Discussion

This paper proposes a conceptual framework to understand education innovation from a service innovation perspective. This is not contradictory to the famous work in 2014 and 2017 by OECD that defined innovation in education and provided examples in areas that are certainly service innovations. The 2017 edition (Vincent-Lancrin 2017) proposes 12 examples that cover some of the elements discussed in this paper, even if most are related to pedagogy, technology, and regulations (Table 3). Most of the examples are in these three areas, while other service innovations in education play a much less important role. These three service co-production areas related to collaboration between teachers and parental involvement are essential from a service innovation perspective, and others may follow, such as cooperation among parents, faculty, and students for new activities, between schools and universities for orientation, between educational institutions and local stakeholders, and between the private sector, policy-makers, and the education sector.

The minor but still relevant inclusion of service co-production examples in the prestigious OECD work on education innovation suggests that the proposal of this paper concurs with the existing literature—that there needs to be a more intense focus on the inter-personal and communitarian aspects of services. The proposed service view will enrich the traditional approaches to education innovation, focusing more on who the key actors work with and how, and less on the individual resources needed to perform the work. This is in line with Willemse et al. (2016), Schaap and Bruijn (2018), Dollinger et al. (2018), and Honingh et al. (2020), among others. Thus, the hypotheses of this paper have been confirmed with this conceptual exercise: education as a service matches with previous literature and education innovation and is appropriate (Hypothesis 1); service innovation modes include traditional education modes but allow new modes to be flagged for further work on relational aspects (Hypothesis 2); service innovation trends and tensions allow us to understand better the trends and tensions in education (Hypothesis 3); and the Lancasterian multiagent framework for service innovation (Gallouj and Weinstein 1997;

Gallouj 2002) is compatible with the current ways of thinking about education innovation (Hypothesis 4), opening up new areas for research.

Table 3. Twelve examples of education in OECD (2017) and their service categories.

Examples Provided by OECD in 2017	Category
1. Possibility for students to design their own experiments	Pedagogy
2. Scope for students to explain their ideas	Pedagogy
3. Explaining the relevance of science in everyday life	Pedagogy
4. Using memorisation of facts and procedures as a pedagogical technique	Pedagogy
5. Using computer simulations for learning	Technology
6. Using computers to practice skills and procedures	Technology
7. Teacher collaboration in form of peer observation	Co-production
8. Teacher collaboration through discussions with peers	Co-production
9. Professional development for students' critical thinking and problem solving	Pedagogy
10. Availability of laptops or notebooks in schools	Technology
11. Parental involvement in school activities	Co-production
12. Public posting of school achievement data	Regulation

The definition of education as a service seems to be obvious but it may not be, as educational organizations have sometimes been criticised for acting as industrial factories producing students with certain standards regardless of the unique interactions happening in the education sector and the role of freedom and community. The preminent purpose of a service-dominant logic in service provision is to look at the need to consider services as services and not as goods or products. In studies by Vargo and Lusch (2008) regarding private services and Osborne (2018, 2020) regarding public services, the authors stress the importance of keeping in mind relationships and collaborative elements for value generation when dealing with persons in co-productive work. This is fully coherent with the results concerning H1, in that taking for granted that education is a service may lead to students being treated like product inputs and not essential partners to co-produce work with. The distinction between good and bad practices in innovation from a service point of view is relevant in this context.

Innovation can happen in the direction of more customization and personalization or more standardization. This is one of the tensions existing in service innovation, and also in education. H3 is also confirmed, as all innovation tensions have similar roots (Gallouj et al. 2015). This points out the importance of experience in service logic, as stressed by Ng and Forbes (2009), Dean et al. (2016), Osborne (2020), and Rubalcaba and Peralta (2022). The education experience itself can be considered as an element of certain service co-production in a social context (Osborne 2020), in which social interactions as community as part of extrinsic or intrinsic participation of different agents (Strokosch and Osborne 2020), another area for future research.

Finally, Hypothesis 4 is fully confirmed. Some multiagent innovations in education could also be considered social innovations, as the new public-private innovation networks for social innovation (PSIN) concept is aiming at (Desmarchelier et al. 2021). Innovation in education is achieved by the different agents involved in educational systems (students and their families, educational centre staff, trainers, teachers and professors, public administrations, the third sector). The focus on service co-production within the multiagent framework is particularly relevant when innovation in education not only requires the motivation of individual freedom, but the existence of innovation ecosystems at all levels of education (Vincent-Lancrin 2017), particularly higher education (e.g., Cai et al. 2020; Castro et al. 2019).

Recent literature focuses on the role of open innovation in services (Chesbrough 2011), the importance of multi-agent frameworks for a correct understanding of service innovation (Gallouj 2002; Windrum and García-Goñi 2008; Gallouj and Djellal 2010) and, more recently, public service logic (Osborne 2020). However, these approaches have not yet been applied to educational services. Whilst there is abundant scientific research on education, only a small part examines the consequences of innovation in education from a service innovation perspective. Rarely have national experiences been compared to find common models or best practices in public or private systems (Glenn 2011). A useful framework to understand the creation and implementation of innovation in education can be found in the service innovation research field, which may lead to interesting policy and managerial implications in both private and public services (Rubalcaba 2006, 2007; Rubalcaba et al. 2010). A service perspective correctly places freedom and the community at the centre of the innovation debate in education, and this is a promising area for future research.

With regard to other future research areas, a complementary topic is education for innovation and the skills societies need to become more innovative. Specific research on each educational level is also needed, such as at universities, which are crucial for innovation in education (e.g., Christensen and Eyring 2011; Wildavsky et al. 2012). Finally, market mechanisms and public instruments that promote innovation in educational quasi-markets (school choice, competition and accountability) also deserve further research. A deeper understanding of what education means as a co-produced service is still needed, along with further research, especially in a society that has largely taken for granted that education is a service while often treating it like a commodity with no need for co-production, just transmission. Service innovation in education and integration in innovation ecosystems is a full area of research.

Of course, this contribution has some limitations. The first and most basic one is the lack of empirical evidence to confirm or reject the hypotheses beyond what has been indicated by the examples mentioned in the literature. This paper is purely conceptual, and further empirical evidence would be needed to check its validity. A second caveat is the need to address specific issues by educational level. Primary, secondary, and higher university are presented together, but refinement by educational level is needed. Finally, only a few key concepts from the service literature were incorporated to analyse education innovation, but a more systemic integration of both private service and public service logic is necessary, and this remains as work for future research.

7. Concluding Remarks and Policy Implications

This paper had two goals and several associated research questions we tried to address. The main goal was to build a conceptual framework for innovation in education based on the service co-production perspective. This was done by analysing four research hypotheses related to definitional issues, modes, trends, and multiagent frameworks. The results indicate the following: (i) the characteristics of education as a service (such as interactive co-production) can be taken into account to better understand how innovations are created and implemented; (ii) innovation modes in education can be aligned with service innovation modes, mainly when a public service logic is adopted; (iii) existing service innovation tensions between customization and standardization are replicated in the education sector; and (iv) multiagent frameworks in service innovation have a particularly visible role in innovative learning communities.

With all of these results, the conceptual framework is summarized by grouping inputs and resources, challenges, markets, modes, actors, and the education innovation ecosystem. The second, more instrumental, goal was to bring together two disconnected strands of the literature: education innovation and service innovation. This was done throughout the paper as continuous benchmarking between the two academic strands in each research area. The connections and synergies have proved to be strong.

Some additional concluding remarks can be provided. The education innovation path has an overall goal: to increase the number and education quality of students who are

able to understand and better live within the reality in which they are born and the whole world, by contributing to building their character through cognitive and non-cognitive skills, and by facilitating their personal and social growth and welfare. Innovation is not a good in itself; it can be good or bad depending on its availability to serve to an ultimate goal. Character building is what defines the concrete goal, but this goal is threefold: cognitive, behavioural, and emotional. For all three aspects, education is offered to students through various formal and non-formal groups and communities. Knowledge and learning are not abstract and cannot be offered without a human social environment and community. The path is never a fully individual path; each individual has their own journey, but individuals grow within social interactions and communities.

Education is a service as a result of co-production between two or more agents. Good service depends on the quality of the interactions. Innovation is needed to renew and guarantee the quality of the interactions. Live communities are communities that promote innovation based on the freedom of teachers, students and parents. Education shows how freedom and community need each other.

The paper shows how innovation must be understood not only in terms of technology, pedagogy, and regulations. These are important elements for innovation, but the customization of education, parent involvement, student engagement, and teacher promotion and care are areas where new ideas can really make a difference. Without the social and human aspects of educational services, education is not education any more. If innovation is just pedagogy, technology, and regulation, with no need for a social role or a human atmosphere, education becomes instruction (mere transmission/acquisition of abilities without any real change in comprehensive knowledge or behaviour). Without innovation from and within communities, education is watered down to instruction. On the contrary, when there is joint work among communities, students' parents can participate in the design and co-creation of educational strategies and policies that improve the educational environment, leading to family-school partnerships and collaborative networks between schools (Willemse et al. 2016; Honingh et al. 2020; Armstrong et al. 2021).

This service-oriented vision of education also has policy implications. The primacy of freedom and community has a policy equivalent in areas such as school choice and curriculum design. There are four main types of policy implications:

- Communities as stakeholders. As policy-makers are also part of service co-production, their own policies should be co-produced with the main stakeholders, which are other educational communities and institutions. Participation by educational stakeholders from private and social communities is essential in interactions with policy-makers.
- Communities as a policy objective. Many educational organizations do not operate as a community, or they underperform due to the lack of community (no knowledge sharing, too much pressure on teachers with too many teaching hours and little time for out-of-class interactions, lack of engagement by students and parents, etc.). Improving schools and educational institutions may have improving community life and performance as an objective.
- Freedom for teachers and schools. In education, adapting to students and families requires an important degree of freedom for teachers and schools. Flexibility in curriculum design, teaching, and organizational change is important to generate innovation. Teachers and schools need to be able to give their best by developing educational service offers they are good at. Fully centralized organization of education by public administrations hampers the freedom to create and innovate, which is essential for change. They cannot replace but promote the free initiative from civil society. Central public administrations have a role in promotion, supervision, and accountability in order to find the right balance between school or university autonomy and the need for public accountability (Glenn 1999).
- Freedom for parents and school choice. Improving education services can be promoted by the state by social actors taking the lead and developing their innovations. Families, religious or civil institutions and third sector organizations should have a high degree

of freedom to create and implement educational initiatives adapted to their own criteria. School choice is already a hidden research consensus (Green 2001) after promotion following a long historical process (Glenn 2012; Morken and Forminocal 1999). Even if no school choice is good, supervision, accountability, and regulation are always needed (Glenn 2004).

- Direct promotion of innovation in schools. The state may also have a role in promoting innovation by different means, such as by reinforcing innovative pilot schools and pilot experiments, giving awards to the most innovative communities, and promoting best practices.
- Comprehensive policies and policy synergies. Education is not only about regulations, but also about institutions (Crowon et al. 1996) that must be coordinated to produce the best educational policies. Policies should be comprehensive in the sense of integrating different areas of activity. The integration of social services in education (Adler and Gardner 1993) is an example of synergy between educational and other policies that should be taken into account and offer room for innovation at the policy level.

These policy implications can be based on the principle of subsidiarity: public administrations should do only what the society cannot do. The key actors of education are private and social agents: families, along with institutions and organisations such as foundations, NGOs, teaching cooperatives, associations, and religious groups. The state has the responsibility to promote social initiatives and, at the same time, to supervise fair use of resources and ensure minimum quality standards, accountability, and the principle of equity and social cohesion.

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