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Towards a service system for social innovation in education: A possible application of MOOCs

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Abstract: This paper proposes a new service system that explains the process of social innovation (SI) in education in a developing country. We selected 17 Ashoka cases in the field of education in Bangladesh and analyzed them thematically. Results show that targets for SI (educational opportunities, employment opportunities, and additional educational resources) are related to the first phase of SI where social entrepreneurs foster innovative ideas that effectively solve social problems. Results also reveal that support for innovation is related to the second phase of SI, in which the SI becomes a social norm. Applying the process, the paper proposes a design of a new SI through the application of massive open online courses (MOOCs) to teach financial literacy to poor people.

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1. Research background

One of the salient features of our society is the incessant urge for creation, adoption, and diffusion of innovation. Innovation is the driver of economic value. On the other hand, social change is the driver of social innovation (SI) (Cajaiba-Santana, 2014). Christensen, Baumann, Ruggles, and Sadtler (2006) viewed social change as catalytic innovation. In contrast, product and service innovations are considered as sustainable innovations (Bower & Christensen, 1995). In addition, SI is considered as a vehicle that creates social change to improve quality of life and that develops solutions and approaches to various sets of problems (Michelini, 2012). Therefore, the aim of SI is to satisfy social needs or solve societal problems (Christensen, Baumann, Ruggles, & Sadtler, 2006; Mulgan, Tucker, Ali, & Sanders, 2007; Phills, Deiglmeier, & Miller, 2008).

Developing countries face various pressing social issues including poverty, poor sanitation, lack of female empowerment, natural disasters, and illiteracy that demand innovation in the social domain. However, almost every government sector in developing countries lacks good governance and transparency. As a result, non-governmental organizations (NGO) in collaboration with governments, as well as business sectors and international organizations, are fostering innovations to tackle these problems. In addition, social entrepreneurs are fostering ideas that effectively solve social problems within their family, community, city, workplace, field, industry, and country. In the same way, formal education systems in developing countries are unable to meet the demands of the 21st century. Therefore, some individual social entrepreneurs of Bangladesh are putting their system changing ideas into practice in the field of education, contributing greatly to changing the quality and quantity of lives of the poor people there.

As is well known, microfinance is a well-established tool for alleviating poverty in developing countries. People tend to think that microfinance only provides financial services for poor people, but it is really a self-employment generation service (Siddike, Kohda, & Hoque, 2015). However, the borrowers' financial awareness is indispensable for them to achieve financial independence. Thus, an appropriate and effective way to teach financial awareness needs to be developed. Now, ICT is also well-developed, and people are enjoying its blessings in every sphere of life. Higher educational institutes are also using sophisticated learning tools and techniques for providing better education.

MOOCs (massive open online courses) are a recent development of open education in distance learning that began to emerge in 2012 using online courses aimed at unlimited participants through open access via the web. In addition, MOOCs provide interactive user forums that help to build a community (Pappano, 2012; Lewin, 2013). Basically, MOOCs and open educational resources are the forms of open education (Wiley, 2015). In general, MOOCs provide improved access to education, derive reputational benefits, and purse education research (Kassabian, 2014). Hew and Cheung (2014) suggested that instructors wish to teach MOOCs of being motivated by a sense of intrigue, the desire to gain personal reward (reputation) and a sense of altruism. Yuan and Powell (2013) indicated the benefits of MOOCs for producers of MOOCs and for learners of MOOCs. They expressed that MOOCs provide opportunities for expanding access to higher education to all through online teaching and learning reducing the budget constraints of the higher educational institutions. They also indicated that MOOCs support life-long learning; fun entertainment, social experience and intellectual

stimulation; continence with barriers to traditional education options; and experience online education.

In case of developing countries, MOOCs provide learning opportunities to a massive number of learners from anywhere in the world as long as they can access the course through the Internet (Liyanagunawardena, Williams, & Adams, 2013). Thus, MOOCs bear huge potential and opportunities, especially for poor people, for the expansion of SI as mobile and Internet connections are available on a broad basis. Therefore, we believe that poor people will greatly benefit from the combination of MOOCs and microfinance. In this study, we propose a SI model where poor people will obtain financial literacy through the application of MOOCs.

The aim of this paper is to propose a new SI service system in the field of learning/education in a developing country like Bangladesh. More specific objectives of this paper are (a) to describe the development process of SI in learning/education; (b) to propose a new service system for SI in learning/education; and (c) finally, to propose a new SI in the field of education for providing financial literacy through the application of MOOCs. The remainder of this paper is organized as follows: Section 2 provides a literature review and describes the proposed theoretical model; Section 3 explains the research methodology; Section 4 shows the results of case analysis; Section 5 conceptualizes the results of case analysis in the paradigm of open education; Section 6 describes the possible application of MOOCs for providing financial literacy; and finally, Section 7 concludes the paper with limitations and future research directions.

2.   Theoretical model of service system for social innovation in education

2.1. Phases of social innovation

Social innovation (SI) is developed in two phases. The first phase is related to the system change, and the second phase is related to the social norm (Praszkier & Nowak, 2012).

In entrepreneurship, the process of effecting change in a market is called "effectuation" (Lusch & Vargo, 2014). Specifically, effectuation theory describes the process of system change and to what extent the system will be changed. Initially, social entrepreneurs work on a trial and error basis, and there is no concrete service system at the beginning of any SI. Over time, a service system grows and after a certain period, it becomes more robust and more resilient (Read, Sarasvathy, Dew, Wiltbank, & Ohlsson, 2011).

The new service system must include at least one group (beneficiaries) that suffers from a social problem and another group (contributors) to solve the problem. In the service system, a pair of actors, a beneficiary and a contributor, meet to solve the problem. In this system, they conduct a service exchange, in which economic values are transferred reciprocally. Specifically, economic value is transferred from the contributor to the beneficiary. The initial stage of an SI is fostered by some entrepreneurs for effectively solving some social problems within their family, community, city, workplace, field, industry, and country. When an SI starts, it spreads slowly and to some extent has to undergo different ups and downs.

The second phase of an SI is to become a social norm. When the beneficiary group becomes large, then the participation in the group becomes a social norm. This social norm is related to institutionalization. Well-established or mature markets can be

thought of as "institutionalized solutions", or socially constructed, normative solutions nested or embedded within a particular service ecosystem. However, because institutions or markets are regularly being translated and recreated, so are the approaches to problem solving (e.g., transportation problems solved by various methods as technology advances), and even institutionalized solutions over time (Lusch & Vargo, 2014).

In the case of SI, the key to form the social norm is to create a need for belonging to the beneficiary group. This is achieved by implementing an appropriate institutional mechanism to create new values. In particular, non-economic value is created by giving the weak (e.g., rural women) leadership through an appropriate institutional mechanism.

2.2. Development process of social innovation in education

We propose a new service process for the SI in education in developing countries. The main difference between a conventional educational service process and our service process is the target people. Conventional service systems generally target regular school, college, and university students. On the other hand, the main target of our service process is the students who have dropped out of conventional education. Our SI is designed to be conducted sequentially in five steps as shown in Fig. 1.
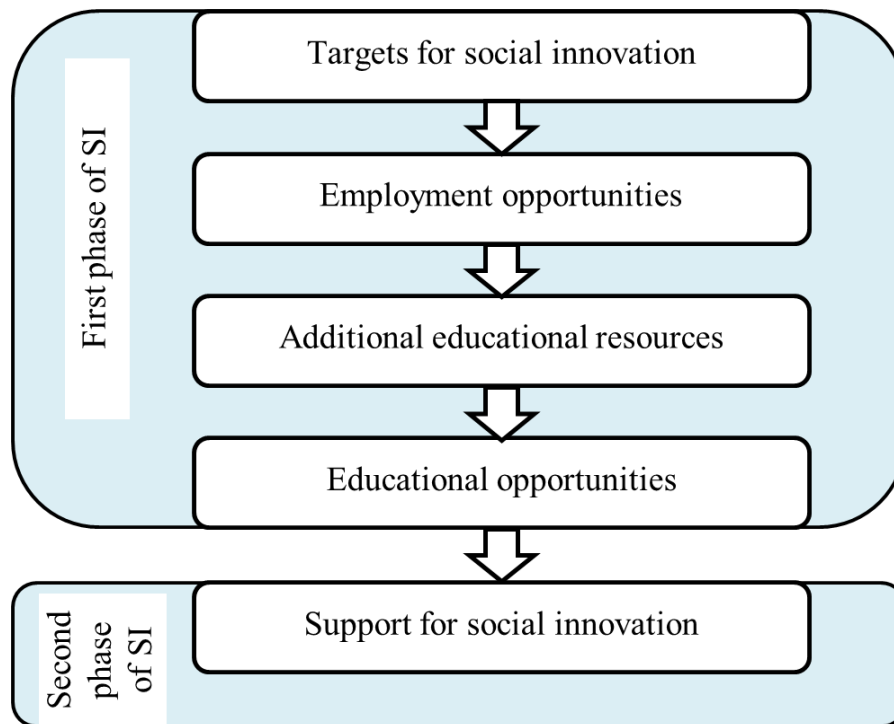

Fig. 1. Five-step development process of SI

The first step of an SI is the target for SI, for whom social problems will be solved. In the case of an SI in education, there are different target groups, including students, adults, young women, single mothers and their children, and so on.

The second step is to increase employment opportunities. In general, the aim of education is to prepare students for jobs. However, in the case of developing countries,

students are hindered from obtaining jobs they desire by several problems including lack of internship opportunities for rural students, lack of creativity of the students, and lack of awareness of available opportunities. Therefore, internships, skill development programs, and computer skills can open up greater employment opportunities for them.

The third step is to provide additional educational resources. In developing countries, traditional education is limited to textbooks and the course curriculum. In the case of SI, different kinds of additional educational opportunities including mobile boat schools, safe housing with literacy education, local mathematical festivals for institutionalized math learning, computer skills, arts curriculums, and debate conferences are provided for the students to improve their education. Students' active participation in lively debate conferences in front of key policymakers creates a sense of community involvement that helps them to exercise their democratic rights in policy decision-making from adolescence.

The fourth step is to increase the educational opportunities to provide additional educational resources to the target for SI in order to give them better future employment opportunities. In the case of SI, several innovative organizations are established to provide education for diverse groups.

The fifth step is support for SI. For sustaining and scaling the SI, different organizations collaborate with the social entrepreneurs. In addition, different international organizations and other donor agencies provide support for sustaining the innovation.
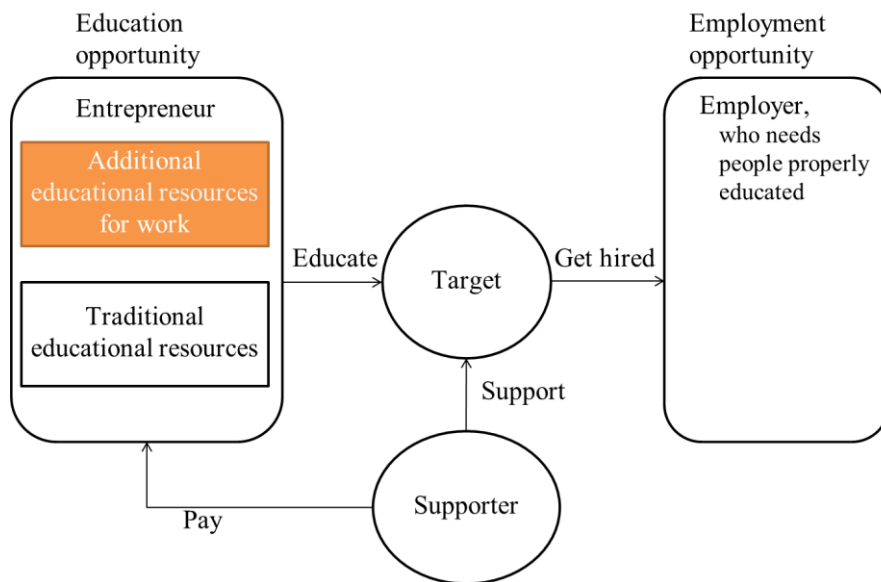

Fig. 2. SI service system in the field of education in developing countries

2.3. *Proposed service system for social innovation*

Fig. 2 depicts the proposed SI service system for education in developing countries. In Section 4, we analyze 17 cases of SI in education to validate the proposed service system. In the traditional educational system, students receive education to prepare them for employment. However, due to their lack of varied skills and experiences, they often fail to obtain jobs in competitive job markets. Therefore, in this new service system,

entrepreneurs provide additional educational resources to students so that they can enjoyably gain creative skills, leadership skills, literacy skills, computer literacy skills, internship experience, and knowledge of science and mathematics. These skills and experiences will ultimately open up more employment opportunities.

Additional educational resources include mobile boat schools, mathematical festivals, mobile science workshop, debate conferences, goal-oriented text books, literacy programs, vocational trainings with trade and technical training, computer and leadership training, creative development skills and transformation of student hostels into learning and business centers. The following sections reveal how MOOCs can set up the path to direct these additional educational resources to the targeted user group of poor people in developing countries.

Table 1
Ashoka Fellows in education in Bangladesh

Cases	Ashoka Fellows	Year of election
1	Muhammad Ibrahim Sobhan	1988/1/18
2	Mashuda Khatun Shefali	1990/12/30
3	Mohammaed Serajul Islam (Shaikh)	1992/11/2
4	Samnata Barua	1993/6/29
5	Runa doja Khan	1994/12/6
6	Mahbuba Leena	1994/12/31
7	Mostafa Shiblee	1996/1/13
8	Afsan Chowdhury	1998/1/10
9	Mahabub Zamal Shamim	1998/1/10
10	Fatima Khanam	1998/12/27
11	Shahidul Chowdhury	2001/9/27
12	Quazi Iqbal Sabery	2002/6/16
13	Shamushul Palash	2002/6/16
14	Matin Ahmed	2003/6/25
15	Omar Azad Chowdhury	2004/7/28
16	A. K. M. Masksud	2006/8/6
17	Munir Hasan	2008/8/18

3. Research methodology

In this study, we selected 17 social entrepreneurs in learning/education in Bangladesh from the Ashoka Fellows' database (Table 1) (Ashoka, 2015a). Ashoka is the world's largest association of leading social entrepreneurs and was founded in 1980 by Bill Drayton in Washington, DC, USA. Every year Ashoka selects their fellows in six broad fields of work: civic engagement, economic development, environment, health, human rights, and learning/education. Ashoka Fellows are leading social entrepreneurs who are recognized to have innovative solutions to social problems and the potential to change

patterns across society. There are more than 3,000 Ashoka Fellows working in over 70 countries in every area of human need (Ashoka, 2015b). We considered Ashoka as a suitable case because it defines SI as any new idea that works for changing the quality and quantity of life.

4. Results of case analysis

4.1. Analysis of cases

In this study, we analyzed the cases thematically. Initially, after retrieving the cases from the Ashoka's databases, we converted them into MS-Excel files. Secondly, three researchers read the 17 cases several times for understanding the social problems and their strategies for solving the problems. In this section, we describe the results of the case analysis in the framework of a new SI service system thematically.

4.2. Brief description of social problems

Table 2 briefly describes the social problems in the field of education in Bangladesh.

Table 2
Brief description of social problems in the field of education

Cases	Brief description of the social problems
1	Education is an expensive luxury for the poor and landless families.
2	Illiterate and poor rural women are migrating to the capital city to work in factories and cannot afford housing with adequate sanitation.
3	The small land of rural communities is not effectively used due to lack of agricultural technical skills.
4	The educational system does not concentrate on the literacy of the adult population.
5	Students are insufficiently creative due to the lack of user-friendly and goal-oriented textbooks and education system.
6	Women cannot find a more favorable education environment or social norms.
7	The educational system fails to provide creative and engaging alternatives.
8	Gradual disappearance of cultural identity, especially for children in rural areas.
9	Parents and teachers do not share information with the youth about sexual abuse and sexually transmitted diseases.
10	Lack of opportunities, particularly for rural women.
11	Computers for learning are not available in rural areas.
12	University student politics creates violence and distracts from education.
13	Children in rural areas have less opportunity outside the classroom to utilize their time in creative activities.
14	The standard of English and IT in state run schools is poor.
15	Children have less attraction and more fear in learning science.
16	The Bede community is deprived of socio-economic benefits.
17	Mathematics as an optional subject in 11th and 12th grades leads to fewer science graduates.

4.3. Target for social innovation

Table 3 shows the target groups for SI in the field of education. Here, we observed that students are the main target. In the rural areas, poor female students are deprived of formal education due to financial difficulties. Secondly, young people are another target group for SI, as they are often illiterate. Thirdly, young women and single mothers who live in city areas and work in the garment industry are also targeted for this SI as they are often not well-educated and sometimes cannot write either. Therefore, social entrepreneurs target them as well as their children for basic education. Another important target group is the nomadic people of Bangladesh. They are deprived of basic education, health services, safe water, sanitation, and personal security. Because they rarely stay in one place for more than a week, local schools are reluctant to enroll their children since their inclusion dramatically increases the dropout rates in these schools. Therefore, social entrepreneurs provide the children of nomadic people primary education through the mobile boat schools.

Table 3
Target, educational, employment, additional educational entities, and support for SI

Cases	Target for SI	Educational entities for SI	Employment entities	Additional educational entities	Support for SI
1	Students		Some labor	Marketable skills first and then reading and writing	Science clubs, Bijnan Shamuyki, Entrepreneur's fund
2	Young women living in cities	Safe housing	Garment industry	Safe housing with literacy education, family life education gender relations analysis and support services from health to child care	Charges from hostels
3	Communities	Video tape	Cultivation of their gardens	Freely distributed agricultural programming videotape	TV programs through TV channels
4	Adults		Employment or micro-enterprises in agriculture, pisciculture, cane and bamboo work, sewing, carpentry and hairdressing	Literacy programs and vocational training with trade and technical training	Donations
5	Students			"User-friendly" goal-oriented textbooks to emphasize critical thinking and self-directed learning	Book publishers
6	Single mothers and their children		Prostitutes, garment factory workers, domestic helpers	Safe full-time care and education for their young children	Volunteers, charges from children students
7	Students		Civic participation and policy impact	Debate conferences	TV channels, newspapers, individual schools provide money
8	Youth		Sex education in general public	Sex education materials, which are culturally appropriate and test-marketed materials	Book publishers, BBC
9	Students		Developing students' creativity and a stronger cultural identity or (art related career)	Art curriculum	Srishti Shaily Shikkahkrami, student charges
10	Female students	Student hostels	The professional work force	Student hostels	Ball pen shop, garments shop, local government

11	Students in rural areas		The professional work force	Computer skills	Donations from local businesspeople, World Bank
12	Students in rural areas	Children's centers		After school-program, developing leadership skills and contributing productivity to their families and communities	Shishu Academy, Bangladesh Shishu Adhikar Forum (BSAF)
13	University students	Organized groups	Culture from politically charged violence to broader-based environmental issues	Groups of students engaged in understanding and protecting their environment through field trips, guided walks, and information analysis	Environmental organizations, donations
14	Students			Fee-based computer skills education (bought from a franchise from an information technology institute) + free English lessons	US based Information Technology Institute, fees from the students
15	Students	Mobile science workshops		Teaching aids and a hands-on method that makes science fun for children	Social Advancement by Local Technology (SALT)
16	Nomadic communities living along rivers	Mobile boat schools	The rights to education and citizenship	Mobile boat schools and teachers on board	BRAC, donations from foreign donors
17	Students	Mathematic festivals		Local mathematics festival to institutional programs to math Olympiad	Book publishers, newspapers, ministry of education

4.4. Educational entities

Table 3 lists different educational entities that foster SI. Alongside the formal educational institutions, these educational entities improve the education of targeted groups. Firstly, mathematic festivals foster fear-free math learning among the students from primary levels to higher secondary. Secondly, science workshops help the students to learn practical scientific skills and experiences from early life. Thirdly, organized groups create environmental-awareness among the citizens. Fourthly, children centers help children to gain artistic knowledge and experience that help them to decide their future career. Fifthly, boat schools foster primary education among the nomadic children of Bangladesh. In addition, safe housing for women who work in the garment industry contains staff to take care of their children as well as provide them basic literacy education. Finally, student hostels are transformed into a libraries as well as business centers for the female students.

4.5. Employment entities

Table 3 shows the employment entities for SI. Entrepreneurs work to develop a strong professional work force for the future through the development of students' creativity and cultural identity and allow citizens to exercise their right to education. In addition, the students work in the garment industry as well as in agriculture, pisciculture (fish farming), cane and bamboo work, sewing, carpentry, and hair dressing for generating income for their family.

4.6. Additional educational entities

Additional educational material for employment is the unique entity of SI. Table 3 shows the list of additional educational resources for employment. Entrepreneurs provide literacy programs, vocational training with trade and technical training, computer skills, leadership skills, and creative development skills as additional educational resources for fostering SI in the field of education. In addition, they also provide reading and writing classes of garment workers; safe housing with literacy education; family life education, including sex education materials; and child care. User-friendly goal-oriented textbooks, freely distributed videotapes of agricultural programs, and distance learning facilities are also provided as additional educational resources for SI.

Teaching aids and a hands-on method that make science fun for children are also innovative educational resources for fostering innovation. Mobile boat schools with teachers on the board are the most innovative additional education facility. Furthermore, mathematical festivals, local art festivals, and debate conferences are also additional events that ultimately create great opportunities for children to brighten their futures. Last but not least, transformation of female student hostels into libraries, computer training centers, ball pen shops, and garment shops provides internships as well income generating opportunities for female students.

4.7. Support entities for social innovation

All social innovation needs to be sustained and scaled up. In case of SI in education, support is also inevitable for sustaining and scaling the innovation. Table 3 shows the support for SI in the field of education. Here, we observed that social entrepreneurs generate profits from their service charges and also obtain money from book publishers, TV channels, and newspapers. They receive support from local government as well as local businesspeople. International organizations and different donors' organizations also help them to sustain the innovation. Moreover, they also receive support from their own businesses like garments shops, ball pen shops, training centers, and students' hostels charges. This support continues to speed up SI.

5. Conceptualizing the results of the case analysis in the paradigm of open education

Our analysis shows that there are several problems solved by social entrepreneurs in collaboration with different organizations (government and other private organizations) through using additional educational resources. More importantly, the result demonstrates that most of the problems are related to illiteracy, and social entrepreneurs are trying to resolve the issues in various ways through the use of different additional resources. At the same time, most of the social enterprises are also trying to reduce poverty through the well-known poverty alleviation tool namely microfinance. It is to be noted that the poor people are the borrowers or customers of microfinance. But these targeted user group even though cannot read and write. Therefore, the social enterprise BRAC, Bangladesh is providing financial literacy to the poor people through its well-designed and well-managed financial educational program, namely pre-disbursement orientation and four days trainings taking the role of a customer service assistant (CSA) (Siddike, Kohda, & Hoque, 2015). In this regard, the CSA supports the provision of financial literacy to the targeted user group.

On the other hand, open education is one of the most rapidly growing fields of education and training in both, formal and non-formal educational systems in developed and developing countries (Moore & Tait, 2002). Particularly, open innovation significantly continues to reshape and redesign of open educational resources to provide formal and non-formal education all over the world. As a result, open education is contributing through widening participation of non-traditional learners, promoting life-long learning and bridging the gap between formal, informal and non-formal education (D'Antoni, 2009). Therefore, the social enterprises can take the advantage of open educational technologies, namely MOOCs, for providing better literacy to the poor people that ultimately helps them to increase their literacy skills, computing skills, and financial knowledge. The next Section discusses a possible application of MOOCs as an open educational technology for increasing the financial literacy of poor people in developing countries.

6. Application of massive open online courses (MOOCs) for financial literacy

MOOCs have the potential benefits (edu-entertainment, easy to understand, and unlimited participants) to enhance online education in developing countries by facilitating collaboration between people, educational institutions, and technology (Boga & McGreal, 2014; Liyanagunawardena, Williams, & Adams, 2013). For example, Cousera, the prominent American MOOC platform provider, has recently partnered with the World Bank and the Tanzanian government to provide MOOCs to African students in an ICT education initiative (Boga & MiGreal, 2014). However, scholars identified a set of problems (inadequate infrastructure, access to computers, technical expertise, online learning skills, and English language proficiency) that suggest MOOCs may not be a viable solution for education for a large proportion of people in the developing countries (Liyanagunawardena, Williams, & Adams, 2013; Warusavitarana, Dona, Piyathilake, Epitawela, & Edirisinghe, 2014; Boga & McGreal, 2014). In the African context, Boga and McGreal (2014) stated that combining MOOCs with mobile phones could be a very powerful way to educate large numbers of people.

In this Section, we recommend applying MOOCs for SI in the field of education in developing countries like Bangladesh. In this new way of supporting SI, rural people will receive their education through MOOCs. They will obtain financial literacy, computer literacy, business literacy, and educational facilities online. When rural people obtain financial literacy and business literacy, there will be a high possibility for them of succeeding in running their own businesses as microfinance is considered as a self-employment generation service for poor people. In this way, new SI could be carried out in the rural areas with the expected NGOs support, thus, providing new learning facilities and new employment opportunities for rural people. Fig. 3 shows the initial snapshot of a new SI service system through the application of MOOCs for teaching financial literacy to poor people.

This new SI can be adopted through the implementation of the designed service system based on the application of MOOCs as shown in Fig. 4. In the initial step, the rural people are the target group for SI. Secondly, microfinance is a self-employment opportunity for the poor people to eradicate poverty from society. Thirdly, financial literacy is improved by the social enterprises in microfinance as most of the customers in microfinance are illiterate. More importantly, they are not aware of their financial transactions. Therefore, social enterprises have recently provided education in financial literacy for their customers.
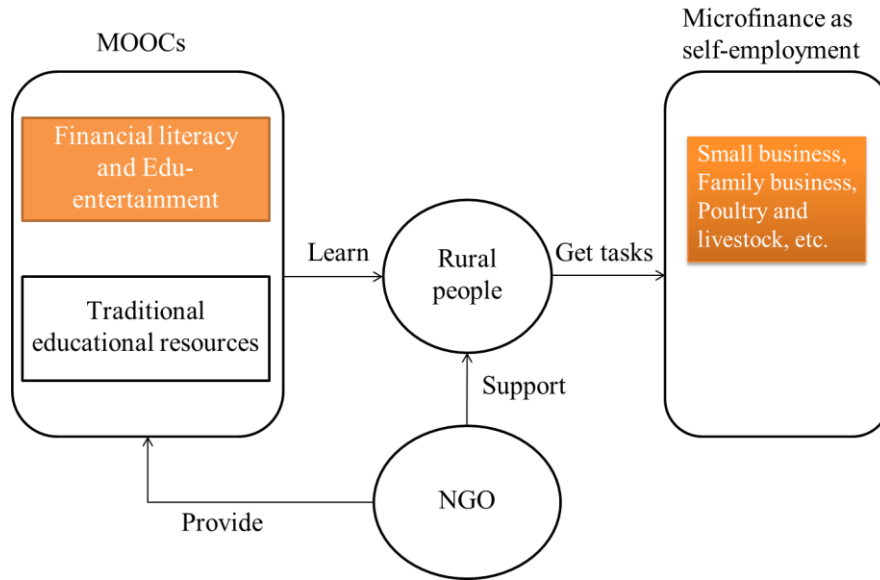
Fig.3. Initial snapshot of new SI service system through the application of MOOCs for financial literacy
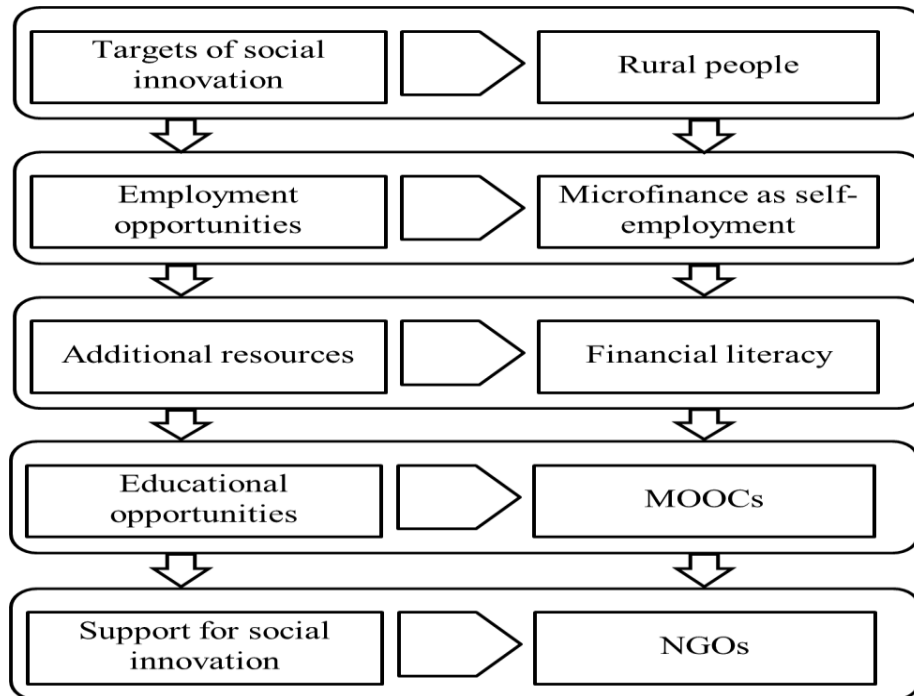

Fig.4. Steps for new SI through the application of MOOCs for financial literacy

In the fourth step, MOOCs will help social enterprises to provide financial literacy in an open educational environment for the rural people, in terms of the additional resources identified in the third step, and explained in the previous Section.

We hope that MOOCs will ensure edu-entertainment educational opportunities for the targeted user group and will be broadly accepted. Finally, NGOs (like BRAC or Grameen Bank) will support the SI in the field of education in developing countries like Bangladesh.

7. Conclusions

This paper presented a SI service system based on the analysis of 17 Ashoka cases. It leads to the use of MOOCs to empower financial literacy and entrepreneurship in rural areas in developing countries. Targets, such as educational opportunities, employment opportunities, and additional educational opportunities are related to the first phase of SI where entrepreneurs foster innovative ideas that effectively solve social problems. Alternatively, this phase of innovation is also called a "process of system change". The last step of SI ('support for innovation') is related to it becoming a 'social norm' or its 'institutionalization'. When the beneficiary group (social innovation) becomes large, then the participation in the group becomes a social norm. Different national and international organizations provide support for sustaining SI.

This research will be continued to effectively mirror further dynamic factors. Firstly, this study is based on 17 cases of SI in one developing country. Thus, a comparative study between developed and developing countries will be carried out to validate the proposed service system for SI in the field of education. Secondly, the proposed SI service system is explained based on the content analysis of 17 cases. Therefore, further qualitative studies will be conducted with social entrepreneurs to validate this system.

We propose a new SI in the field of education in developing countries through the application of MOOCs for providing financial literacy. Application of MOOCs in SI will enhance the online experience and increase financial and computer literacy skills of the rural people. As a result, they will obtain more opportunities for self-employment. A possible practical implication of our proposed SI refers to microfinance institutions like BRAC that have recently been teaching financial literacy to customers by introducing the new role of a customer service assistant (CSA) (Siddike, Kohda, & Hoque, 2015). A CSA is responsible for teaching financial literacy and giving support to the customers. Therefore, we believe that if BRAC's microfinance program adopts MOOCs for providing financial literacy, poor people will increasingly enjoy the benefits of using technology for education, whereas a CSA can work as an intermediary for communicating with the targeted user group how to use MOOCs taking also feedback on the user acceptance and satisfaction for content adaptation demands.

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