

# ACADEMIC LIBRARY DEVELOPMENT PROJECTS AS TOOLS IN DESIGNING PEDAGOGICAL APPROACH IN INFORMATION LITERACY

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## ABSTRACT:

*Information literacy, "(...) the ability to think critically and make balanced judgements about any information we find and use. (...)" (CILIP 2018), is an important skill set for academia in the 21<sup>st</sup> century. Over the years since its first inception, it has become a key competence for academic librarians to offer to students.*

*Although there has always been a need to find, evaluate, and effectively use information, the abilities needed to do so have just grown larger, more complex, and more important in the information and communication technology (ICT) environment. There is also a shift towards broader contexts, to connect information literacy with an active, effective and responsible citizenship (Virkus, 2003).*

*Information literacy is about dealing with information overload – how to choose and decide what is useful and trustworthy. Hence, the focus of information literacy training was different from Bergen, with a large amount of electronic information resources in 2007, to Brasov, with less (Repanovici & Landøy 2007; 2014).*

*Our common interest in information literacy in academic libraries also led us to reach out internationally, and apply for funding to support the development of IL in academic libraries in Republic of Moldova, and in the Western Balkans. In this paper, we will show examples of best practices from the projects.*

*In the Republic of Moldova, we joined forces with Academy of Economic Sciences (ASEM) in Chisinau. First, we trained the ASEM librarians, and then we developed a new project, where we targeted all academic libraries in the republic. In this project, the libraries were supported to make IL trainings for their students, as well as Open Access and bibliometric services (Landøy et al 2017).*

*Transilvania University of Brasov also participated in two Erasmus+ CBHE-projects: One in Armenia, Moldova and Belarus and one in Western Balkans. In both these projects one of the modules for staff development is "enhancing librarians' development in teaching Information Literacy".*

*In this paper we will show how the collaborations from our libraries within development of information literacy and other issues, has been beneficial for students and academics at our universities as well as in the international projects we have participated in.*

**Key words:** *Collaboration; Norway; Romania; Moldova; Western Balkans; Information literacy; Academic libraries; Development*

## 1. INTRODUCTION

University of Bergen Library and Transilvania University of Brasov have collaborated for more than a decade, with a special focus on joint development projects and joint research in Library and Information Science matters. One aspect of our collaborations is in development of information literacy (IL), both as a theoretical concept and as practical trainings for our students (Repanovici & Landøy 2007; 2014).

Our first joint research and development study took place in 2007. Wanting to support and augment our understandings of students' acts and attitudes with regard to library usage, we handed out short and similar paper-based questionnaires. They were given to students in both libraries, fall term 2007 and spring term 2008. In Bergen we had 93 respondents, 100 in Brasov. The questionnaires had been developed in Romanian, translated to English and then to Norwegian. We wanted to explore students conduct and understandings with regard to the use of

libraries, especially the university library, and the electronic resources provided. (Repanovici & Landoy 2014)

Students both in Bergen and in Brasov replied that they preferred the Internet as information source, and wanted to access it from home. At the same time, we found that they were not knowledgeable with evaluation of electronic information resources, with ethic notions, with plagiarism and the communication of the results in the scientific research. Thus, this needed to be taken into consideration when planning information literacy trainings. (Repanovici & Landoy 2014)

The trainings, as they were developed and given, were carefully to evaluated. The post-training evaluations from students were compared, and used as basic for further development of courses.

*“Students find these courses useful and relevant. In evaluations, they give high marks for relevance, and they also comment upon this when asked, be it written or oral. When asked what they find relevant, the answers cover both the practical tools for finding information (databases, journals, other resources, as well as the new knowledge in searching and evaluating information. Flattering enough for the library and the actual librarian, students also give the library high marks for performance, and for the conception of the course.” (Repanovici & Landoy 2007)*

Students evidently regarded the course as more relevant if it included practical tasks as a starting point, and that it would be offered exactly when they needed it. Keeping the students’ concerns about their use of time in mind when planning meant that we would use different search examples for different group of students. Professors/university teaching staff told us that they realized their students had learned new information literacy skills. Also, they realized that they were relieved from using tutorial time to show students how to evaluate information and how to cite. The university teaching departments kept asking for courses for more student groups at more levels. (Repanovici & Landoy 2007)

When information literacy is considered a tool for dealing with information overload – how to choose and decide what is useful and trustworthy it became obvious that the focus of trainings would be different from Bergen, with a large amount of electronic information resources in the library in 2007, to Brasov, with less.

We also share with you the results of our latest research in students’ attitudes to the university library, and the development of academic libraries:

In 2016 we did a web-survey with Survey Monkey among Transilvania University of Brasov engineering students, and interviews in Bergen. In Brasov, there were 105 respondents: 27 % male, 73 % female; 39 % in their first year and 43 % in their 4th year. The student’s ages were 18-21 years: 38%, 22-23: 50 %, over 24:12 %.

In Bergen, there were 12 students interviewed: 5 males, 7 females. 3 at bachelor level and 9 at master. They were all users of the library. 8 were from the Faculty of humanities, 1 law, 3 from social sciences, and they were invited to have a coffee and an interview. (Landoy & Repanovici 2016)

We wanted to discover what, if anything, students envisioned as new and interesting trends in academic libraries. In the survey, the suggestions were formulated in the questions, but in the interviews, there were no pre-formulated suggestions. (Landoy & Repanovici 2016).

Brasov students wanted the library to be more like a learning centre, providing connection to electricity and internet (93 of 105 students replied that this was the most important). The second most important were “boards, video projectors connected to laptops for presentations” (73 students agreed to this), and third “furniture - tables and chairs - which can be moved”. The least important of the formulated choices was “mobile walls to create various private spaces for individual or team study”.

In Bergen, all 12 students would use “boards, video projectors connected to laptops for presentations” and half would use “furniture - tables and chairs - which can be moved” and “mobile walls to create various private spaces for individual or team study. Internet and electricity were not mentioned by any of the students, probably because it is seen as given (Landoy & Repanovici 2016).

If the library was called “Centre for Technological Transfer”, the Romanian students saw “copy and printing devices and scanners” as the most important feature, closely followed by “workshops on various topics of interest” and “laptops and mass-media technology for borrowing”. “Gaming space” was least important (Fig. 1 Facilities provided by Centre for Technological Transfer).

3. Which of the following facilities should be provided by the Centre for Technological Transfer on a scale from 1 to 5, where 1 - least important, 5 - most important?							
Answer Options	1	2	3	4	5	Rating Average	Response Count
An area with 3D printers, supplies and related software	2	1	20	32	49	4,20	104
Gaming space - Lego, chess for stimulating creativity	7	17	34	29	17	3,31	104
Copy and printing devices, scanners	0	2	8	26	69	4,54	105
Laptops and mass-media technology for borrow (photo)	0	5	12	30	58	4,34	105
Online documentation regarding the use of the	0	4	29	35	35	3,98	103
Online documentation for downloading and using the	1	4	15	28	55	4,28	103
Online communication with a specialized support IT	1	7	12	38	46	4,16	104
Training courses for using the various technologies	0	3	15	37	50	4,28	105
Exhibitions of new products by different companies	2	6	19	32	46	4,09	105
Workshops on various topics of interest	0	4	13	26	62	4,39	105
Others							2
<i>answered question</i>							<b>105</b>
<i>skipped question</i>							<b>0</b>

Fig. 1 Facilities provided by Centre for Technological Transfer

In Bergen, where the majority of the students were from the Faculty of Humanities, the library/learning centre would be a more interesting place than the centre for technology transfer, according to the students that we interviewed. All 12 would be interested in relevant books, journals, media, databases (both printed and electronic) and 9 mentioned study spaces in different kinds of zones (more or less quiet; with or without computer). 8 found accommodating and knowledgeable library staff to be important (Landoy & Repanovici 2016).

## 2. INTERNATIONAL DEVELOPMENT PROJECTS

Our common interest in information literacy in academic libraries also led us to reach out internationally, and apply for funding to support the development of IL in academic libraries in Republic of Moldova, and in the Western Balkans.

In the Republic of Moldova, we joined forces with Academy of Economic Sciences (ASEM) in Chisinau. First, we trained the ASEM librarians, and then we developed a new project, where we targeted all academic libraries in the republic. In this project, the libraries were supported to make IL trainings for their students, as well as Open Access and bibliometric services.

The project contains diverse capacity building activities:

- Workshops
- Summer schools
- Study trip to Bergen
- Participation in conferences
- Strategy development
- Learning and sharing best practices
- English language skills

And some networking and content-activities:

- Electronic journals
- Bibliography
- Institutional repositories

- Academic writing centres
- Dissemination activities
- Project web page

In the project, all 18 academic libraries in Republic of Moldova collaborated, under the guidance of University of Bergen Library, The scientific library of Academy of Economic Science and our Romanian expert.

In the project document, it is stated that: “If the project is successful the librarians working in the academic libraries in Moldova will be better trained for running modern library services. This will influence the quality of higher education and research. The librarians will have better English language skills, and will have strengthened their networks, both within and outside Moldova. The general public will have a better understanding of the importance of libraries.”

Information literacy is only one part of the project, and the practical activities include a week of summer school, where different aspect of IL in academic libraries, both in Republic of Moldova and internationally was discussed. The newest trends of IL, Gamification, and Academic Writing Centres, were also explored. Later, there was a workshop with deliverables: trainings to be developed and performed, and evaluations to be reported.

Transilvania University of Brasov was head of a TEMPUS project: “Developing information literacy for lifelong learning and knowledge economy in Western Balkan countries, 2010-2013”. In this project IL programs for lifelong learning and their use in curricula was developed, including innovative online IL modules for lifelong learning and the harmonization of the IL programs with those currently active in Western Balkan countries. The project aimed at strengthening the capacities of higher education institutions in the Western Balkans for the strategic planning and implementation of IL programs to instill transferable skills for a competitive, dynamic, knowledge-based economy.

<http://www.lit.ie/projects/tempus/default.aspx>

Transilvania University of Brasov also participated in two Erasmus+ CBHE Projects: (561633) “Library Network Support Services (LNSS): modernizing libraries in Armenia, Moldova and Belarus through library staff development and reforming library services” 2015-2018 <https://lnss-projects.eu/amb/curriculum/module-4-information-literacy-research-skills/and> (Erasmus+ CBHE Project 561987) “Library Network Support Services (LNSS): modernizing libraries in Western Balkans through library staff development and reforming library services” 2015-2018 <https://lnss-projects.eu/bal/>

In the 2 ERASMUS + projects one of the modules for staff development is enhancing librarian’s development in teaching Information Literacy, Module 4, Information Literacy Research Skills Information Literacy & Research skills- to help learners find and use information effectively and ethically- this module will cover:

- International Information Literacy Standards- SCONUL, ACRL, ALA, ANZIL,
- Using Online Information Literacy Modules for teaching Information Literacy
- Mind the Information Gap! Knowing the critical information sources and resources
- Critically analysing information resources
- Referencing citation and Avoiding Plagiarism
- Introduction to the Literature Review
- Using Electronic Library Databases for your research
- Evaluating sources of information
- Web & Internet search strategies for the Information Age
- Using Bibliographic software for your referencing and research
- Academic writing including Dissertation Writing
- Becoming a Subject Liaison Librarian: skills for collaborating with Academic staff
- Information Literacy for Entrepreneurship

— Train the Trainer: Teaching and pedagogical skills for Librarians.Lnss-projects.eu. (2019).

In LNSS project developed in Western Balkans, the consortium developed Library Network Support Services Western Balkans Platform on LibGuides. Lnss-albania.libguides.com. (2019). (Fig. 2)

The Western Balkan Online Library Platform is a highly inventive, innovative and unique collaborative reservoir of related library resources and expert content which can be used, shared and further developed by any Library or Information Center to help develop their service.

Using this resource and platform, the project developed a host of resources, both in English and to be translated into the language of partners. Libraries in the Western Balkan region are now part of the international community Springhare, a unique global phenomenon of over 120,000 libraries from 80 countries.



Fig. 2: The Western Balkan Online Library Platform  
(<https://lnss-albania.libguides.com/c.php?g=665627&p=4714039>)

### 3. CONCLUSIONS

The collaborations from our libraries within development of information literacy and other issues, as shown in this paper, has been beneficial for students and academics at our universities and in the projects, we have participated in.

Project collaboration has generated a strong impact in participating countries. The impact is measurable through co-published works, courses, summer schools, workshops and trainings attended by many librarians. The introduction of the *Information Literacy* course in the curriculum of many specializations and the awareness of the importance of the *Information Literacy* in the academic environment contributes to this. Graduates with abilities to search, evaluate and ethical use of information will help their easier integration into the labor market and raising the level of critical thinking of citizens, who are able to think, analyze and make the best decisions.

Our noble mission proved to be rewarding with professional achievements.

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# THE ROLE OF MOOCs IN ACHIEVING THE SUSTAINABLE DEVELOPMENT GOAL FOUR

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## ABSTRACT

**Purpose-** Education is one of the most powerful and proven vehicles for sustainable development. More specifically, Education for All has been a core issue of international development. Sustainable Development Goals in Education (SDG 4) is “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (Uvalić-Trumbić& Daniel, 2016, p. 35). MOOCs can be the handy way to achieve such inclusive and quality education for achieving Sustainable Development Goals (SDGs). MOOCs changes the way of teaching as well with the help of electronic resources which can make our classroom more meaningful and efficient ever than before. Through the proper use of electronic resources student can gain knowledge more practically, more visualization is possible which can make long-term benefits for the learners and practitioners which leads us towards the attainment of Sustainable Development Goals (SDGs). This paper is aiming at illustrating the potential of MOOCs for achieving the Sustainable Development Goal 4 (Quality Education) as binding for all nations of our planet which eventually affects all 17 Sustainable Development Goals (SDGs).

**Design/methodology/approach** – The study is descriptive in nature based solely on secondary data. To accomplish the objectives of the study, authors reviewed (Exhaustive Content Analysis) related prior surveys, reports, articles and studies. Systematic charts, statistics, graphs and related tools were used to visualize how MOOCs helps to attain sustainable development in education.

**Findings** – This study indicated how MOOCs are valuable to give quality, inclusive education and what the future extents of MOOCs are. Explicit consideration is given to why students use MOOCs and what the potential drawbacks to MOOCs are. Finally, it showed how MOOCs helps to accomplish the sustainable development goals.

**Research limitations-**The study was solely based on secondary data. It could be better to impart some primary data with respective respondents to generalize the implications of the study.

**Originality/ Value-** This study has drawn attention to the importance of the relationships between MOOCs and sustainable development attainment in the current context. The findings have significant implications for researchers and practitioners. Despite the existence of research on sustainable development, no empirical study was conducted particularly on MOOCs towards sustainable development related research.

**Keywords:** MOOCs, Education, Sustainable development Goals (SDGs), Bangladesh.

## 1. INTRODUCTION

“Narrow the gaps. Bridge the divides. Rebuild trust by bringing people together around common goals. Unity is our path. Our future depends on it.”(António Guterres,Secretary-General of the United Nations, 2018). So, to build a better future, Heads of State and Government of the 193 member countries of the United Nations adopted agenda for Sustainable Development (SDG): 2030 on September 2015. The creation of this path to promote sustainable development was undertaken through the setting up of 17 Sustainable Development Goals (SDGs) with 169 targets. The 2030 agenda for Sustainable Development provides a global blueprint for dignity, peace and prosperity for people and the planet, now and in the future. The SDGs cover social and economic development issues including poverty, hunger, health, education, global warming, gender equality, water, sanitation, energy, urbanization, environment and social justice (UN Report, 2016).

Education for All has been a concept at the heart of international development since 1990, firstly within the Millennium Development Goals and more recently within the Sustainable Development Goals (SDGs), most notably as SDG 4, 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all' (Uvalić-Trumbić & Daniel, 2016). In addition to that, '*SDG 4 is to be achieved through the accomplishment of ten targets, which together represent the most comprehensive and ambitious agenda for global education ever attempted*' (OECD, 2017 p. 27).

Obtaining a quality education is the foundation to creating sustainable development. In addition to improving quality of life, access to inclusive education can help equip locals with the tools required to develop innovative solutions to the world's greatest problems. More recently the OECD has noted: *Making SDG 4 a reality will transform lives around the globe. 'Education is so central to the achievement of a sustainable, prosperous and equitable planet that failure to achieve this particular SDG puts at risk the achievement of the 17 SDGs as a whole. It is well recognized that education plays a critical role in eradicating poverty and steering the vision for prosperous and sustainable development'* (OECD, 2017 p. 27). Probably Nobel laureate Malala Yousafzai says the best line in short so far about the importance of education for attaining SDGs which is "*All the SDGs come down to education*". A World at School's Policy and Advocacy Director Kolleen Bouchane (2015) said: "*Education has a unique power to catalyze gains in other areas. Very few, if any, health or economic interventions will be sustainable without gains in education.*"

While education, and higher education, are seen as critical to the SDGs there are those who see distance education (Through MOOCs) as playing a central role (e.g., Uvalić-Trumbić & Daniel, 2016), those who see open educational resources as important (MacKinnon, Pasfield-Neofitou, Manns, & Grant, 2016), others who forefront education for sustainable development (e.g., Gokool-Ramdoos & Runjaun, 2016). MOOCs, a term introduced in 1998 by Jay Cross, founder of the Internet Time Group, has become extremely popular. Nowadays, it has become a viable alternative to traditional education methods, so it has been adopted by many institutions, countries across the globe especially because of the possibility of wide access. According to CIPD (2013), MOOCs can be defined as 'learning that is delivered, enabled or mediated using electronic technology for the explicit purpose of training, learning or development in organizations. While the definition provided by Kaplan-Leiserson (2002) seems to be comprehensive, it shows the different forms MOOCs may take. This definition is 'MOOCs is education or training courses delivered to remote locations via synchronous or asynchronous means of instruction, including written correspondence, text, graphics, audio or video tape, CD-ROM, MOOCs, videoconferencing interactive TV, facsimile, and the World Wide Web' (cited by Stone, D. and Dulebohn, J, 2013).

MOOCs can be handy and effective way to attain SDG 4 in many ways. Massive open online courses (MOOCs) are free open education offered through online platforms which is an important tool to achieve Goal 4 (Patru, Mariana; Balaji, Venkataraman, 2016). MOOCs can play a crucial role in reducing the 'Digital Divide' and strengthening 'Democratization of Education' (Anshu Miglani and Ashish Kumar Awadhiya, 2017, p.58). MOOCs offers the access to quality education to the learners in a cost effective way irrespective of their location (Fozdar & Kumar, 2007).

Mobile Learning (m-Learning) have emerged as a trend in the field of education. It is removing the time and geographical barriers for learning by placing learning opportunities at the fingertips of learners (Awadhiya, A. K., & Miglani, A. 2016).

Quality education influences the trajectory of an individual's actions for decades and, in a collective sense, determines the course of human society itself. In other words, progress with the rest of the SDGs critically depends on advancing SDG 4 (P.S. Narayan, 2017). So, with improved education, so many other areas are positively affected. In short, education has the

power to make the world a better place what sustainability actually means. MOOCs help to attain SDG 4 and eventually all the SDGs will affect positively towards attainment within 2030.

## 2. LITERATURE REVIEW

Education is, therefore, also considered as the bedrock of the socio-economic, cultural and political uplift of a society or a country. Education is necessary because it acquaints people with the need-based skills, knowledge and information in their respective fields. Education strengthens the capabilities of the people and helps to bring them up as the knowledge population (Ritimoni B.2018).Although the benefits of education for the individual are clear, the aggregate effects on economic growth are more difficult to measure and remain a matter of dispute (Krueger and Lindahl,2001; Pritchett, 1997; and Bloom and Canning, 2004).The United Nations Conference on Environment and Development (UNCED) highlighted the potential role of education in relation to sustainable development (Rickinson, Lundholm, & Hopwood, 2009).Education is held to be central to sustainability (McKeowyn 2000). Indeed, education and sustainability are inextricably linked.

Access to Education and Training Resources: As documented in the accompanying background paper -‘An Analysis of the Role of ICTs to Achieving the MDGs-A Background Paper’, a number of the African countries including Rwanda, Ghana, Ethiopia, Nigeria, South Africa, Algeria, Tunisia and many others are implementing various forms of education programs and initiatives using ICTs to improve and widen access to educational resources in a number of ways including: improved access to learning materials and resources, widening of access to education through MOOCs etc. A number of these initiatives are contributing to promoting universal primary education in a number of these countries.

MOOCs can be raised as an alternative way for making education accessible and for providing scope for skill-based education at a minimum cost. In fact, MOOCs, in particular, can play a significant role in transforming and empowering the vibrant adult population of a country into productive human resources by providing need-based training and equipping them with need-based skills, which are necessary for maintaining a decent standard of living (Ritimoni B., 2018). But there are no such studies have made on the role of MOOCs as an aid of attaining SDG 4 and eventually the attainment of Sustainable Development Goals (SDGs). Some studies also contributed to demonstrate the ways of achieving SDGs and challenges of attainment of some particular goal(s). But no such study was conducted on the impact of MOOCs on the attainment of SDG 4 (Quality Education). These gaps call for further empirical studies such as the current study to add to the literature.

## 3. METHODOLOGY

The study is descriptive in nature based solely on secondary data. To accomplish the objectives of the study, authors reviewed related articles, Statistics, News, Conventions and studies. Systematic charts, graphs and related tools were used to visualize how MOOCs helps to attain Sustainable Development Goals (SDGs) particularly in education (SDG 4). The study uses following conceptual framework to examine how MOOCs helps nations to attain sustainable development goals in education (SDG 4) and eventually the all 17 sustainable development goals (SDGs).

Conceptual framework of the research:

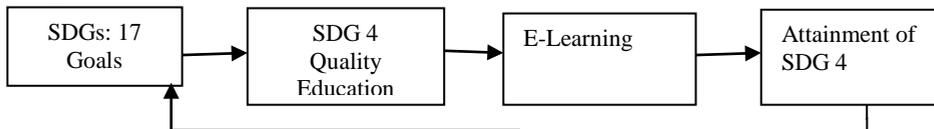


Figure: How MOOCs aid to attain SDG 4 and SDGs

#### 4. ANALYSIS AND DISCUSSION

**Sustainable Development Goal 4** is the education-related goal of the United National 2030 Agenda for Sustainable Development, adopted in September 2015. Its overall aim is: to “*ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*”. MOOCs offer education through online platforms. The (initial) philosophy of MOOCs were to open up quality education to a wider audience. As such, MOOCs are an important tool to achieve Goal 4 (“Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”). SDG Dashboards (2018) provides the latest updates (detail in Appendix) of SDG 4. Here, the study will provide a roadmap for achieving the 10 targets (7 outcome targets and 3 implementation targets) which constitute SDG4 (Quality education) though using E-learning and related means. By reviewing related studies, cases, events the study tried to summarize that, how the MOOCs help to achieve each targets of SDG 4. The findings are summarized as below:

##### *Seven Outcome Targets*

#### 4.1 Universal primary and secondary education

By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

Access to a basic education (Primary and or secondary) is the fundamental right of every child on earth. Educational access increased enormously in the past century. Illiteracy fell dramatically and a higher proportion of people are completing primary, secondary, or tertiary education than ever before. Despite this progress, however, in some parts of the world, this privilege appears to be far out of reach. There are approximately 57 million children who do not attend school, due to living in remote or conflict-affected areas, or caring for sick parents or orphaned children. Moreover, the numbers of children needing secondary schooling are considerable. Some 400 million children from 12 to 17 are not in school (Binder, 2006). While MOOCs will never completely replace formal schooling, still it is a valuable tool available for those limited by the constraints of having to be somewhere at a specific time and place to attend classes. MOOCs can shift the way in which education is delivered and accessed, and assist students in remote and regional locations to obtain a basic/fair education.

For example, MOOCs are now use as a means of making education more accessible to the African continent, regardless of gender, race, religion or geographical locality. Some African countries are using ICTs to create new avenues for access to schooling for the underserved communities and vulnerable groups (Clement Dzidonu, 2010). As documented in the accompanying background paper - ‘An Analysis of the Role of ICTs to Achieving the MDGs-A Background Paper’, a number of the African countries including Rwanda, Ghana, Ethiopia, Nigeria, South Africa, Algeria, Tunisia and many others are implementing various forms of MOOCs programs and initiatives using ICTs to improve and widen access to educational resources in a number of ways including: improved access to learning materials and resources, widening of access to education through MOOCs etc. A number of these initiatives are contributing to promoting universal primary education in a number of these countries.

## **4.2 Early childhood development and universal pre-primary education**

- By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education

Basic education builds on preschool education and education in the family. It is the only the stage of education, that all pupils have to. Basic education is divided to primary education and secondary education (J. Tupy & J. Jerabek, 2007). Quality early childhood development and pre-primary education so important to following education of a child. MOOCs can be handy in that particular time of education. Studies have shown that children learn by using their senses. It is assumed that the sense of sight and hearing are the most important senses in the learning process. **Shepherd Chimururi**, the executive director of an audio and visual learning company in Zimbabwe, observed the positive impact of both audio and visual elements in the classroom. When he compared the abilities of two children, he realized that the child who had watched a video of a trumpeting elephant had a longer lasting and clearer image of the scenario than the child who had only seen a picture of the elephant. MOOCs has this positive impact on learning because children develop better hand-eye coordination and motor skills. These skills help them to form clearer images and improve their capabilities to solve problems. Besides learning skills, MOOCs can help children to develop emotional and social skills. MOOCs can have a powerful impact on children's behavior. **Christopher Pappas**, founder of The Industry's Network, explains that MOOCs software that uses bright colors and images can increase the engagement of learners. In practice, children are more motivated to learn when they see an interactive and colorful screen in comparison to a boring black and white map on paper. MOOCs platforms also provide a range of multimedia tools which help children to communicate with other children and teachers. Through cooperation and interaction, kids learn new topics more easily and have better insights (Anne Steinhoff, 2016).

Many digital tools enable the connection between two children, two countries, and two cultures. For example, Glovico is an organization which offers real-time courses with native teachers. A connected device and Skype are sufficient to link a child in a developing country with a native teacher anywhere else in the world. Moreover, Glovico is a Social Businesses which operates specifically in developing countries. Glovico permits people from developing countries to be teachers and earn additional income and enables children to get foreign language classes from home.

## **4.3 Equal success to technical/vocational and higher education**

- By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university

That particular target asserts that, It is imperative to reduce barriers to skills development and technical and vocational education and training (TVET), starting from the secondary level, as well as to tertiary education, including university, and to provide lifelong learning opportunities for youth and adults. The provision of tertiary education should be made progressively free, in line with existing international agreements.

Vocational and Technical Education (VTE) is one of the manpower development programmes of study that is attracting the attention of various countries around the world. MOOCs have changed the face of education, training and vocational learning forever (Draves, 2002).

Ueno, Maomi (2004) conducted a study that, proposes a model of transnational technical and vocational education and training (TVET) delivery through the use of MOOCs. The results from this trial indicate that the use of MOOCs is a very efficient method for delivering TVET between countries and in promoting communities of practice. In the study of Muhammad Bappa-Aliyu

(2012), which aim to assess the Necessities of integrating MOOCs in Technical and Vocational Education, the study concluded that MOOCs is so significant that no any TVE program can afford to neglect, thereby recommending its full implementation in all areas of TVE and practically oriented courses. The use of interactive electronic media has proven advantageous in recent study on vocational and technical education students and even seen as a solution to shortage of staff and materials in the field (Karahocaa, et-al, 2010). Eventually, MOOCs is the right direction to move towards for TVET institutions in developing countries. There should also be gradual investment in MOOCs in developing countries in order to increase prospects of future growth and development in these economies. *TVET systems in Africa are slowly and steadily also starting to move towards implementing MOOCs in their teaching learning process* (Edwin Obwoye, M., & Stela Kwamboka, O. 2016).

#### 4.4 Relevant skills for decent work

- By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

Today, the young people who represent the world's most dynamic human resources are almost three times more likely to be unemployed than adults. Young people aged 15 to 24 make up 18% of the global population but 40% of the global unemployed. (Silvia Montoya, 2018). Here TVET is also crucial, because it is estimated that 80% of the jobs undertaken worldwide require technical and vocational skills (UNESCO 2005). In 2016, according to the U.S. Bureau of Labor Statistics, workers hold a job for an average of 4.2 years before moving on. And 35% of workplace skills in all industries are expected to change by 2020, according to the World Economic Forum (Forbes: William Arruda, 2018)

MOOCs can be useful ways to improve access to skills training (ILO). According to Karmakar (2000), MOOCs creates opportunities for organizations in the following ways: save time, cost, and effort; satisfy educational needs from remote areas; provide self-learning opportunities; have a positive impact on the learning process and provide a mechanism for collaborative learning which leads to relevant work for generations to come. MOOCs can be raised as an alternative way for making education accessible and for providing scope for skill-based education at a minimum cost. In fact, MOOCs, in particular, can play a significant role in transforming and empowering the vibrant adult population of a country into productive human resources by providing need-based training and equipping them with need-based skills, which are necessary for maintaining a decent standard of living. (Ritimoni Bordoloi, 2018). Across the world, health workers are using ICTs as a medium of MOOCs to remind parents about their children's vaccinations; farmers are using them to market their crops; and once voiceless people are coming together as never before to make their voices heard.

#### 4.5 Gender equality and inclusion

- By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations

The primary objective of the MOOCs is to provide knowledge and skills to those who did not have access to learning. MOOCs contribute to remove gender equality by giving women and girls improved access to education (Patru, Mariana; Balaji, Venkataraman, 2016). Students with disabilities, rural students, students with parental responsibilities and job holders are populations

who now have increased access to higher education due to MOOCs. Access limited by the location of the student, life circumstances that cannot be changed, or responsibilities that cannot be ignored, no longer act as barriers to higher education (Susan L. Renes, 2015). MOOCs/e-teaching for students with disabilities provides the e-environment for them to learn (Bjekiü et al. 2012). Today, e-education (MOOCs/e-teaching is the central part of e-education) of students with disabilities is already widespread (Barrett, 2011). In India, Indira Gandhi National Open University (IGNOU), they established some Special study centers for some identified groups (Women, Minority community, physically challenged, rural community Residents of Remote and Isolated areas, Scheduled Castes, Scheduled Tribes 9. Jail inmates) those are not in formal education. The Study Centers are using successfully MOOCs mediums to make them include in education. So, MOOCs tool ensures easy access to education for all in turn promotes inclusive education.

#### **4.6 Universal youth literacy**

- By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy

Literacy continues to be a pressing global challenge: nearly 760 million adults worldwide are illiterate and up to 250 million children are not acquiring basic skills even though half of them are in school. This data also shows the urgent need for imparting education to millions of people living in this world. But can new digital technologies finally help crack the literacy problem? Therefore, democratization of education is an absolute necessity so that everyone can get equal opportunity in education without any bias and differentiation. However, for proliferating the benefits of education, there is an urgent need to reduce the disparities present in the Indian education system, and make education accessible in the real sense, so that everyone irrespective of caste, class, religion, sex, place, occupation, etc. can avail the benefits of education. MOOCs is particularly useful for inspiring young students to achieve these benefits. MOOCs can help students transcend the limitations of their geographic locations, conquer their financial difficulties, overcome time constraints, solve their problems and better their lives in every imaginable way. At present in India, Study Webs of Active learning for Young Aspiring Minds (SWAYAM), has been introduced by the Ministry of HRD, GOI, where teachers from institutions like the IITs, IIMs, and central universities have been offering online courses to the citizens of India to inspire and include youths to have educations.

#### **4.7 Citizenship education for sustainable development**

- By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

MOOCs is the unifying term to describe the fields of online learning, web-based training and technology-delivered instruction. Nothing is changing as fast as all the terms related to MOOCs. It is evident that MOOCs has transformed our society as 'knowledge society' (Claudia Blezu, 2008). Through the online media people are getting updates from all around. Different online educational platforms, Data banks, portals are helping students to get knowledge in different aspects like Education, Economy, Social, international issues. Through the rooming online platforms, a learner can learn any aspect as he/she likes with no time, thus got the necessary knowledge, information and facts of the esteemed area of learning.

### **Three means of implementation**

#### **4.8 An Effective Learnings environment**

- Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.

MOOCs can become a great addition to the traditional learning process, making it more diverse and allowing students from all over the world to gain additional knowledge about certain subjects. However, it's important to develop both types of educational technologies equally and learn how to combine them in a most effective way in order to get the best results. Today's learners want relevant, mobile, self-paced, and personalized content. This need is fulfilled with using e-learning; here, students can learn at their own comfort and requirement. The time required to learn through MOOCs is reduced to 25%-60% of what is required in traditional learning. As eLearning is a paperless way of learning, it protects the environment to a lot of extent. As per a study done on MOOCs courses, it has been found that distance-based learning programs consumed around 90% less power and generated 85% less amount of CO2 emissions as compared to traditional campus-based educational courses. With eLearning, there is no need to cut trees for obtaining paper. Thus, eLearning is a highly eco-friendly way of learning. MOOCs delivers following benefits which are very crucial to build a proper learning environment: Online learning Accommodates Everyone's Needs, Lectures Can Be Taken Any Number of Times, offers Access to Updated Content, Quick Delivery of Lessons, Scalability, Consistency, Reduced Costs, Effectiveness, Greener approach, flexibility and Less Impact on Environment etc. Due to the wide set of benefits it gives to students; MOOCs has become quite popular and appreciated among students all over the world.

#### **4.9 Scholarships**

- By 2030, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programs, in developed countries and other developing countries

In line with the SDG4 -Education 2030 focus on equity, inclusion and quality, scholarships should be transparently targeted at young people from disadvantaged backgrounds. With tuition rates raising an average of 3.5% every year, scholarships are one of the best ways to reduce these growing costs and scholarship search platforms exist to help students find the most relevant one. Online platforms are the easiest way to search and apply scholarships worldwide. Though there are few steps or actions still prevailing in the path of scholarships but these are minimal, we should say. Communicating with concern professor, having information of scholarships, preparing proposal and related works are getting a piece of cake than before through extensive use of online platforms.

#### **4.10 Teachers and educators**

- By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States

'MOOCs have the potential to revolutionize the way we teach and how we learn' (DfES, 2003). Over the past years, MOOCs has become a vital source of expansion and studying in education. Due to the opportunities created by MOOCs, teaching and learning can now happen at any time and in anywhere. The explosive growth of the World Wide Web (WWW) has made information technology a popular platform for providing e-service, MOOCs service (Richard & Haya, 2009; Fry, K., 2001). MOOCs could be an effective tool for transferring knowledge and it has a potential to overtake the traditional teaching method. Web-based training helps facilitate learners and instructors in educational environment. Tao et al. (2006) really thought that this new learning environment was centered on electronic networks had found a way for undergraduate to have learning schedules that is more suitable for them as well as separate from other students (Tao, Y. H., Yeh, C. R., & Sun, S. I., 2006). With the developing of computer and Internet technologies, this technology has a high interaction and collaboration level between instructors or lectures and peers than traditional environment for learning (Giddens, A., 2001). Hence, MOOCs system might be able to deliver a broad array of solutions to enable learning and improve students' performance. There are numbers of advantages for using this technology and learning materials in the university classroom (Hassan, M. S., 2007): More active learning class, Diversified teaching method, Better student attention and realization, Effective time management for lecturer's, and Visual stimulation. The major advantage of MOOCs lies in its flexibility and ability to cover distances. The curriculum can be repeated until it is understood by the students. Hence full time and part time undergraduates can take part in their degree courses selected from any place or location so students can gain multiple learning ways depending on their needs (Aggarwal, D., 2009).

Above analysis clearly exerts that, MOOCs certainly a handy way to attain every targets of SDG 4 and eventually the Sustainable Development Goals (SDGs).

## **5. CHALLENGES TO ATTAIN SDG4 THROUGH MOOCs:**

Just as a glass may be half full, it may also be half empty. MOOCs do have its pros and cons. The pros are mostly focused on the availability, low costs, and flexibility of the whole process. The cons, however, are mostly about the personal and emotional factors. Thus, the challenges to attain SDG 4 with using MOOCs are:

- Since MOOCs is based on Internet technology and it creates a virtual "class room" for the students; therefore, it depends on Internet connection. Also, this technology requires students to have a massive technical skills and Internet connection with high bandwidth to download the materials from the courses and upload their tasks or work with e-system.
- Tsai and Weng's (2015) study pointed out that social support from mentors and peers (usually a neglected factor) has significant effect on students' learning satisfaction; also, family support affects students' continuous intentions to participate online courses. Therefore, MOOCs may possibly deteriorate institutions' role of socialization. Traditional education allows students to socialize, to make new friends, and to learn something more from their professors. With MOOCs, this can be hard (if not impossible) to achieve. That's why some students might feel isolated and deprived of support.
- Since tests for assessments in MOOCs are possibly done with the use of proxy, it is very difficult to regulate bad activities like cheating.
- MOOCs depend on technology a lot. Therefore, equipment failure is an obstacle to implement proper MOOCs.
- Cloud computing facilities are not familiar to each and every one. But these are the mighty way to implement successful MOOCs system.
- While MOOCs might look like a learning tool available to anyone, in reality, it's not. Not all people have stable internet access and computers that are powerful enough to support online streaming.

- Some might have all the necessary technologies but struggle with using it. For example, older students might find it hard to master all the newest tech gigs. This problem, however, can be solved by offering them some proper tutorials.
- Being able to learn at a comfortable pace and organize your learning on your own is a disaster for some students. While some people are good in self-organization, some cannot do this without having a clear deadline on writing a term paper and the need to report their progress to the teacher. Some can do so but still feel better working and learning around people because it motivates them more.
- The feedback is one of the biggest drivers of students' progress. The students are able to improve only when they know their flaws and weak points. While online instructors do give students feedback, they still might not have enough time to work with them properly, explaining every detail. This could lead to some students falling behind, having gaps in their knowledge, and not completing the course successfully enough.

## **6. POLICY RECOMMENDATIONS**

- Today, still only 47% of the world's population has access to the internet. In some regions, such as the Arab States and the Asia-Pacific, the rate of internet access is even lower—and in Sub-Saharan Africa, that figure is a dismal 25%. Even for those who have access, the reading material on the internet is of widely varying quality, while digital devices pose their own problems of use and abuse.
- It must be noted, though, that MOOCs will require some technological skills for students and teacher. Moreover, ability for collaborative work and autonomy are necessary, to avoid isolation.
- A considerable investment of time and effort, especially in the case of the teacher, is needed. This will help to ensure the involvement and commitment of all students.
- Compared to traditional teaching, students acquire a greater role. More participation and responsibility is expected from them. This requirement of discipline from the student will teach him to develop habits and skills such as managing your time, motivation and organizational skills, all of them vital to the workplace.
- MOOCs must be linked to the core policies and strategies of education and research.
- Training should be provided to the facilitators, teachers and all concerned officials of regarding proper use MOOCs.
- Above all, government needs to develop a MOOCs Policy to provide support for the deployment of digital technologies and affordable broadband and Internet services across the length and breadth of the country to address the “digital divide.”

## **7. LIMITATIONS AND SCOPE OF FUTURE STUDY**

The paper gives an overview of some of the existing initiatives that were taken to aid in achieving SDG 4. The impacts of MOOCs on sustainable education were illustrated thoroughly and shown the importance of MOOCs as critical success factor for achieving the SDG 4 eventually all the SDGs. But, the study was solely based on secondary data. It could be better to impart some primary data with respective respondents to generalize the implications of the study.

## **8. CONCLUSION**

At a special UN summit in September 2015 world leaders adopted a new vision for global development: “Transforming our world: The 2030 Agenda for Sustainable Development. The Sustainable Development Goals provide a ‘recipe’ for countries to be productive and prosperous, resulting in populations that are well-educated and well-equipped for employment in the 21st century. Education plays in developing the knowledge and skills of people for a socially

progressive society and a vibrant knowledge-based economy (Council of Ministers of Education, 2012). Education for Sustainable Development (ESD) empowers people to change the way they think and work towards a sustainable future" (UNESCO). ESD is the process of equipping students with the knowledge and understanding, skills and attributes needed to work and live in a way that safeguards the three dimensions of SDGs as: environmental, social and economic wellbeing, both in the present and for future generations.

And, MOOCs can facilitate as well as strengthen the education to a significant extent. It is because MOOCs can easily provide quality education and global learning at the doorstep of the people at a cheaper cost. It also encourages people to share their knowledge and innovative thoughts by using various means of MOOCs in a wider context. The cons of MOOCs, however, are mostly about the personal and emotional factors. Most of them aren't critical and can be easily fixed with time. Thus, MOOCs surely works as critical success factor for achieving the SDG 4 eventually attaining all sustainable development goals (SDGs).

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