Prospects for Agricultural MOOCs in an ODL System: YCMOU's Experience

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Prospects for Agricultural MOOCs in an ODL System: YCMOU's Experience

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Abstract

Purpose – The Government of India initiated a programme "Study Webs of Active Learning for Young Aspiring Minds" (SWAYAM) in 2017, with the aim of achieving three important principles of education policy, viz. access, equity and quality. The major objective of this programme is to make teaching and learning resources available to everybody. Accordingly, several courses are hosted on this platform which consist of course content such as video lectures, text material, web reference links, PowerPoint presentations, tests and quizzes, along with an online discussion forum. These Massive Open Online Courses (MOOCs) can be accessed by anyone, anywhere and at any time, free of cost.
Yashwantrao Chavan Maharashtra Open University (YCMOU) has produced its first MOOC in agriculture and uploaded it on the SWAYAM platform. A study has been conducted to assess the learners' views on this online course in agriculture.

Methodology – A MOOC entitled "Commercial Fruit Production: Pomegranate and Guava" was produced and offered twice in 2019. An online questionnaire was distributed to the enrolled learners to gain feedback about how they had become aware of the course, their usage of it, and their opinions on the quality of the content of the MOOC offered through an open and distance learning (ODL) mode. The responses obtained were converted into percentage data.

Findings – The initial response to the MOOC was overwhelming with an enrolment of 1,443 learners, though only 4% appeared for the examination. Eighty-two percent of the respondents had not studied a MOOC before and became aware of the course from sources such as the SWAYAM portal, the Internet, faculty and friends; and 76% of the learners accessed the course from home, mainly through mobiles and laptops.
The majority of the learners were satisfied with the content and quality of the course as well as the presenter's knowledge. Forty percent of the respondents reported the use of more scientific and difficult words in video lectures, whereas 14% were annoyed by the background music used in the video lectures.

Implications – Since 1990, YCMOU has offered various agricultural programmes through the ODL/blended mode and about **3,37,000** learners have completed these courses to date. Learners' responses to the emerging educational model of MOOCs will help to frame the policy in future for the implementation of online courses in the field of agriculture.

Keywords: SWAYAM, MOOC, Agriculture, ODL system, Pomegranate, Guava,

1. Introduction

Once a fantasy, agriculture education through Open and Distance Learning (ODL) is now very well established. Earlier, face to face counselling, print material, assignments, PowerPoint presentations, CD-ROM, audio-visual aids were essential components of the ODL system. Gradually there was the addition of online learning, mobile learning, e-learning, e-learning modules, etc. There is continuous evolution in educational technologies and tools. Gamification in learning, microlearning, cloud-based learning systems, MOOCs and OER are the recent popular additions.

There are many important milestones in the evolution of the online educational process. To improve the effectiveness of online learning, the word Moodle (Modular Object Oriented Dynamic Learning Environment) was first introduced and registered by Martin Dougiamas in 1999 by launching the first Moodle site in Curtin University. Moodle was a learning platform designed for educators, administrators and learners providing a single robust, secure and integrated system and enabling students to learn in a personalized learning environment. Later, in 2003, Moodle.org released the first workshop for its open-source learning platform, and the first-ever Moodle Moot was launched at Oxford in 2004 (History, n.d.). Offline Poodles was the next invention by MAF Learning Technologies (Poodle for Moodle: a desktop ……, 2010).

One of the first programs of its kind, MIT OpenCourseWare began offering course material on its website free of cost and with a very permissive license in 2001 (Goldberg, 2001). Georges Siemens and Dave Cormier used the term Massive Open Online Course (MOOC) for the first time in 2008 for a course offered at the University of Manitoba, Canada (McAuley *et al*., 2010). In this course, web tools such as blogs, wikis, Moodle forums, Twitter, etc. were used as a part of the learning process for the first time. In 2011, Stanford professors Peter Norvig and Sebastien Thrun offered their *Introduction to Artificial Intelligence* MOOC which became so popular that almost 20000 students completed the course (Ng & Widom, 2014). They mark the start of instructor-directed MOOC (xMOOC). Thrun went on to found Udacity the next year, a website developing and offering free online courses (Chafkin, 2013). Another Stanford Professor named Andrew Ng founded Coursera, a similar platform which partnered with various universities to create educational content (Wikipedia: Andrew Ng. (n.d.). The idea of MOOC became so popular that in 2012, MIT stepped in with the MITx platform subsequently renamed as edX after a partnership with Harvard (Wikipedia: edX. (n.d.).

Due to very many reasons like accessing the course material anytime, anywhere, interacting the teachers and other learners, accessing the content regardless of any geographical boundaries, facilitating enrollment of unlimited learners, the examination on choice and academic credit transfers, the concept of MOOC has become very popular all over the world. Today, with the top five providers like Coursera, edX, Udacity, FutureLearn, and Swayam, MOOC movement has reached 110 million learners, over 900 universities launching 13500 courses, 50 MOOC based degrees and 820 micro-credentials all over the world (Shah, 2019). Technology-enabled learning (TEL) via MOOCs of COL, 2014 is another example enrolling 5,000 participants to this TEL-MOOC in 2017. (Technology-Enabled…., n. d.).

In India, one national open university and various state open universities popularized ODL concept and endorsed online learning in one or other form. In the year 2017-18, around 4,032,000 student enrolled in universities under distance mode constituting to 11% of the total enrolment in Higher Education in India (Open and ….., n.d.). With the launching of SWAYAM, India's national MOOC platform, learners from the traditional system of education also have picked up the idea of online learning. MOOCs have now become part of the education system in India. Moreover, due to COVID-19 pandemic since March 2020, almost 98 % of institutions have turned in-person classes online. In India, there are five platforms devoted to online learning, viz., NPTEL launched in 2003 by IIT, Madras, mooKIT launched in 2012 by IIT Kanpur, IITBombayX launched in 2014 by IIT Bombay, IIMBx launched in 2014 by IIM, Bangalore and SWAYAM fully launched in 2017 by MHRD, India.

Agricultural education is no exception in this endeavour towards offering free and online learning resources. Early on, in 2001, the Food and Agriculture Organization (FAO), launched the Information Management Resource Kit (IMARK) and now all IMARK modules, are available at no-cost either through the IMARK website (IMARK launches ....., n.d.). The African Virtual University (AVU) developed a first-of-its-kind interactive instructional telecommunications network with agricultural universities in Africa, Canada, Europe, UK and USA for sharing educational resources. An online certificate programme in organic agriculture offered by the Washington State University Global Campus was another breakthrough for online learning in the agricultural field. Lifelong Learning for Farmers (L3F), a holistic model emphasizing continuous learning among farmer during the period 2012-2015 effectively reached a large number of farmers (Lifelong Learning…., n. d.)

In India, the establishment of Yashwantrao Chavan Maharashtra Open University (YCMOU) in 1989 was a crucial step towards distance learning and is a pioneer in offering agriculture courses through ODL system. The launch of e-KrishiShiksha, an e-learning portal on agricultural education by Indian Agricultural Statistics Research Institute (IASRI) in 2013, was a significant turning point underscoring the importance of online learning among the learners from the traditional stream.

Another significant development was the formation of the National Virtual Academy for Indian Agriculture (NVA for IA) in 2014. It is an initiative of a team of ICT and agriculture experts and educators from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad partnered together with the Indian Institute of Technology (IIT) Bombay. It launched IITBombayX, a non-profit online platform in 2014 and offered the first MOOC, "Diseases of Horticultural Crops and their Management" in February 2015 (India's First Free ....., 2015). Also, Commonwealth of Learning, Canada came up with the launching of agMOOC, an online platform offering of its first MOOC in Agriculture, i.e. 'ICT in Agriculture' in 2015.

1.1 SWAYAM

In 2017, the Ministry of Human Resource Development, Government of India launched SWAYAM MOOC's platform as a Digital Initiative. SWAYAM is acronym for 'Study Webs of Active–Learning for Young Aspiring Minds'. It is an indigenously developed platform which serves as the national MOOC portal. It is being designed

and maintained by the Ministry of Human Resource Development, Govt. of India. This portal facilitates the hosting of all courses taught in classrooms from 9th grade to post-graduation. The content can be to be accessed by anyone, anywhere and at any time. These courses are interactive and are made available free of cost to all the residents of India. More than 1200, specially chosen faculty and teachers from across the country have taken part in designing these courses. It is expected that in the near future, the SWAYAM platform would be capable of hosting about 2000 courses and 80000 hours of learning, covering school, undergraduate, postgraduate, engineering, law and other professional courses. Over 10 million learners have already enrolled on this platform (MHRD, 2018).

1.2 Yashwantrao Chavan Maharashtra Open University, India:

Yashwantrao Chavan Maharashtra Open University, Nashik, India is a university established by the Maharashtra State Legislative Assembly Act No. 20 on July 1st, 1989. It is a State Open University and is recognized by University Grants Commission, India under section 12 B. The primary objectives of the university are -

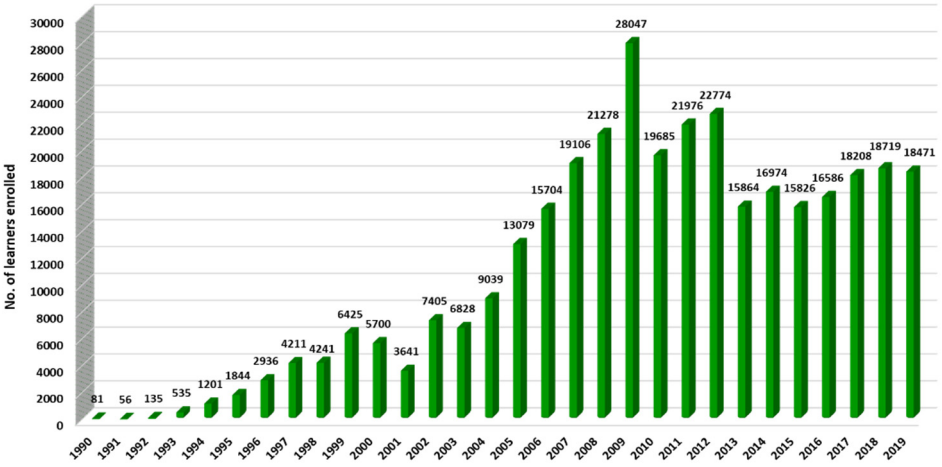
i) To make higher, vocational and technical education available to large sections of the population
ii) To give special attention to the needs of the disadvantaged groups and people in rural areas and women
iii) To provide an innovative, flexible and open system of education by using distance learning methodology and by applying modern communication technologies in education.

At present, YCMOU, India is offering more than 200 programmes and every year, on an average, 150,000 new students are registered for the various programmes. The cumulative enrolment as it stands today is more than 3,600,000 students (Statistical Information....., n.d.).

1.3 School of Agricultural Sciences

YCMOU has been a pioneer in offering agricultural programmes through distance mode. There are four State Agricultural Universities in Maharashtra State, all offering agricultural education through traditional mode and in English medium. YCMOU, India ventured in providing agricultural education through open and distance mode by establishing the School of Agricultural Sciences in 1989 to provide vocational and higher education and to promote open and distance education in agriculture.

Since its establishment, the School of Agricultural Sciences has developed and implemented various certificate, diploma and degree level programmes in agriculture reaching out to almost 337,000 farmer learners till date. Initially, crop-wise programmes covering only a single crop were started. With the initial enrollment of 81 students in the year 1990, these crop-wise programmes began gaining popularity. With this successful experience, School of Agriculture Sciences developed and implemented various diplomas, degrees, postgraduate degrees and PhD. level programmes.



Graph 1: Year wise enrollment of YCMOU learners in Agricultural Sciences

Imparting education through state regional language and the unique feature of vertical mobility played a crucial role in popularizing these agricultural programmes through distance mode. It enabled a 10th failed poor farmer learner to reach up to the degree level, enhancing his day- today farming skills. Minimal admission fees and counselling sessions only on Saturday and Sunday has resulted in an overwhelming response to YCMOU programmes in Agricultural Sciences from the farming community in the State since 1990. The yearly enrollment for these programmes has reached around 19000 (Graph 1).

1.4 YCMOU - MOOC

Anticipating the need of the hour, YCMOU designed and developed its first MOOC in agriculture entitled as, "Commercial Fruit Production: Pomegranate and Guava" as per the SWAYAM guidelines dated June 1st 2017 (Guidelines for....., 2017) in March 2019. The MOOC is a part of diploma as well as a degree-level programme named Diploma in Fruit Production / B. Sc. (Horticulture) offered in distance mode by School of Agricultural Sciences, YCMOU, India. This is a MOOC developed with financial funding from National Coordinator, IGNOU-SWAYAM.

The major aim of this programme is to educate the farmers, farm labourers and rural youths in latest farming technologies, help them update the traditional way of farming with improved skills and techniques and thereby help them join the educational stream. This is a four-week course with English as a medium of instruction.

This one-credit online course contains the entire production technology of two major fruit crops, viz., Pomegranate and Guava. It covers the latest production technology of these two crops, including its climatic requirements, varieties, planting techniques, fertilizer and irrigation requirement, intercultural and special practices, maturity indices, harvesting techniques, etc.

Fig. 1: The MOOC offered on SWAYAM platform

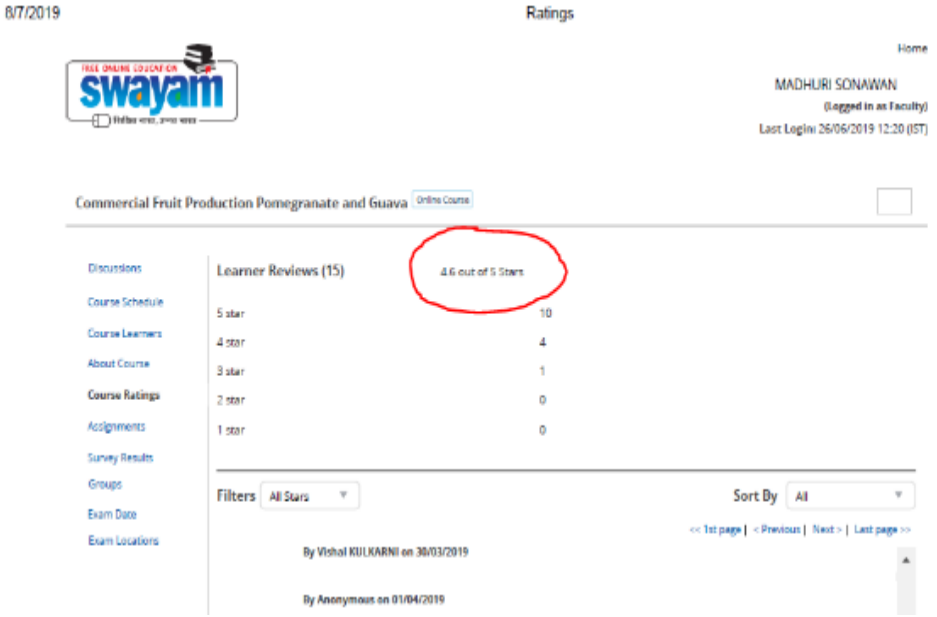


Fig. 2: Rating based on learners' reviews

2. Methods and Procedures

The topic being entire fruit production technology of two major fruit crops, i.e. pomegranate and guava, it was necessary to incorporate various stages and operations carried out in these two fruit crops. For the development of this MOOC, the challenging task of identification of crop-wise locations, on-field video shooting and on-screen presentations of various teacher experts was completed and 20 video lectures of different durations were developed.

While preparing the MOOC, a four-quadrant approach was followed. Accordingly, along with video lectures, illustrations, presentations, Web Resources, Related Links, Open source Content on Internet, research papers & journals and Discussion forum as well as Assessment containing Multiple Choice Questions, Quizzes, etc. were incorporated. The entire MOOC was uploaded on the SWAYAM platform in February 2019 and offered initially in March and then in August 2019. At the first instance, the MOOC received 4.6 ratings out of 5. Table 1 shows the number of learners enrolled and appeared for examination.

Table 1: No. of learners enrolled and appeared for examination

Sr. No.	MOOC runs	No. of learners enrolled	No. of learners appeared for examination	No. of learners passed the examination
1.	MOOC offered in March 2019	450	20	6
2.	MOOC offered in August 2019	993	38	23
	Total	1443	58 (4%)	29 (2%)

An online questionnaire was distributed among the enrolled learners to gain feedback about awareness, usage and content quality of the MOOC offered in agriculture through Open and Distance Learning (ODL) mode. The responses obtained were analyzed systematically for improving future online courses and assessing shortcomings which may have occurred during the current session.

3. Results

As mentioned in the methodology, all the enrolled learners were invited to complete the online questionnaire. In all 80 learners responded and submitted the survey and were considered as respondents for the study.

3.1 Demography

The demographic data of the respondents depicts that among the 80 respondents, 46% were male, 53% were female, and 1% preferred not to respond to the question on gender (Fig. 3). As with most online learning courses, the demographics lean heavily towards younger respondents who are more comfortable accessing online resources.

Figure 3 indicates that the majority of respondents (64%) are in the "under 25" age group. While indeed an encouraging number of female respondents (39%) was observed in the age group, "below 25". The age group, "26-35" showed gender disparity with a sudden drop in the number of female respondents as compared to the male respondents. This fall perhaps reflects the engagement of women in shouldering the household responsibilities and motherhood in the peculiar age range of 26 to 35.

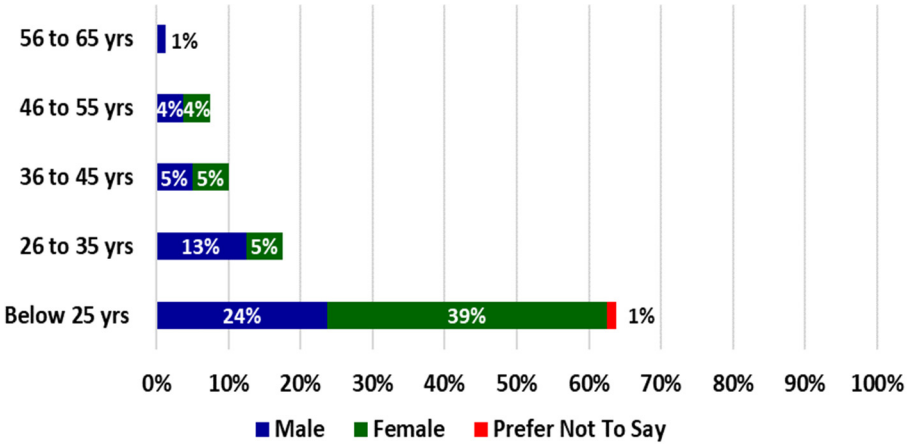


Fig. 3: Age and gender of the respondents

Majority of the respondent learners (43%) were either studying at undergraduate level or had completed their graduation, followed by postgraduate degree (21%) and Ph. D. (15%). Around 16% of respondents have completed higher secondary level of education (Fig. 4).

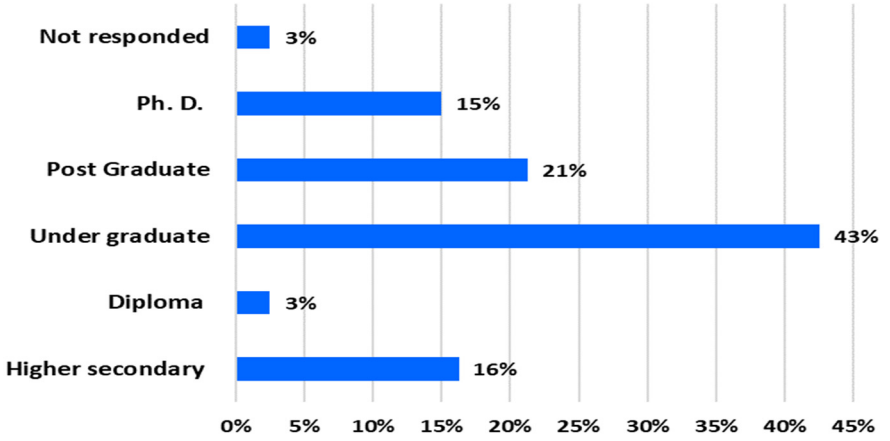


Fig. 4: Educational level of the respondents

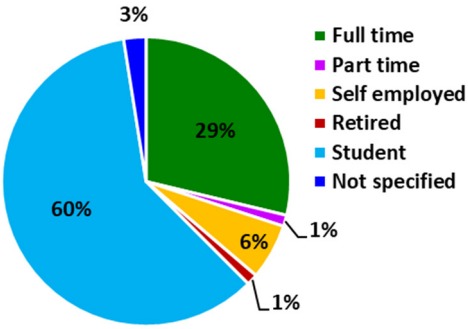


Fig. 5: Occupation of the respondents

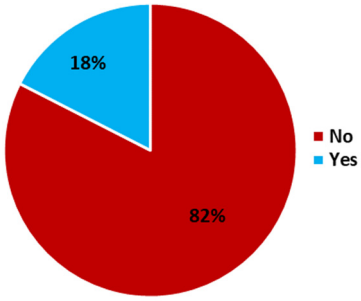


Fig. 6: Earlier experience of studying MOOC

As far as the occupation of the learners is concerned, figure 5 shows that the majority (60%) of the respondents were students followed by 29% of respondents being full-time working professionals. The majority (80%) of the respondents were first time online learners without having any earlier experience of studying through MOOCs (Fig. 6).

3.2 Access to Course

According to figure 7, most of the respondents became aware of the course either through SWAYAM portal (28%) or through institutional faculty (21%) followed by internet search (18%) and friends or relatives (15%). As figure 8 depicts, the highest number of respondents (55%) accessed the course due to 'personal interest' possibly to get more in-depth knowledge followed by ‘for professional development’ (41%) and to improve the 'general knowledge’ (33%). Around 10% of the respondents expressed the intention to create their own MOOC.

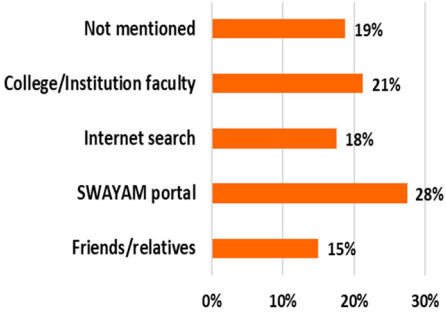


Fig. 7: Modes of awareness about the course

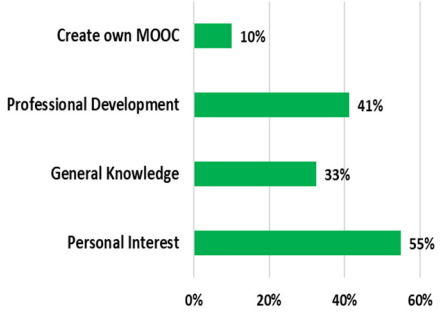


Fig. 8: Rationale for enrolling in the course

Regarding the preferred location of accessing the course, a majority (76%) of the respondents favoured their homes followed by the library (15%) and office (13%). A few respondents (5%) accessed the course from cybercafé. Most of the learners (75%) used mobile-based data, while 26% and 10% of respondents had good bandwidth and high bandwidth, respectively. Majority of the respondents (68%) used mobile to access the course. Many respondents accessed the course through either a mobile (68%) or a laptop (48%), and a few respondents (15%) used a desktop. A very small number of respondents (1%) used smart TV to access the course (Fig. 9, 10 & 11).

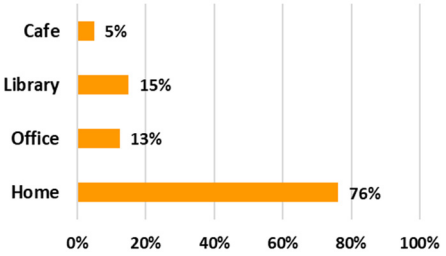


Fig. 9 : Location of accessing the MOOC

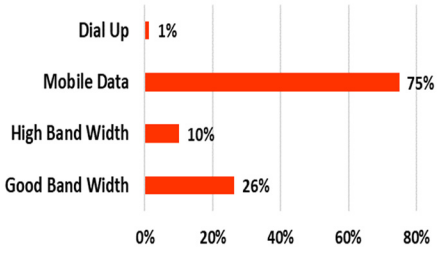


Fig. 10 : Connectivity to access the MOOC

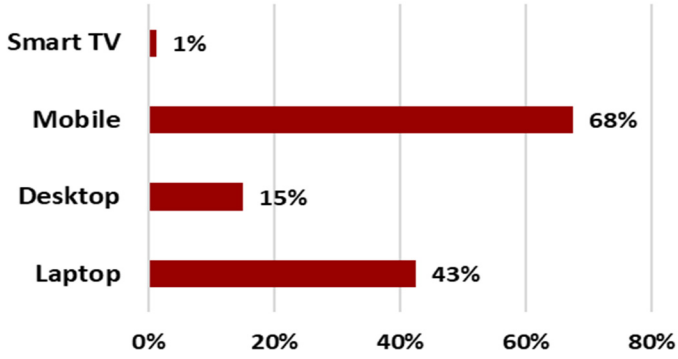


Fig. 11 : Device used to access the course

3.3 Learning experience on SWAYAM platform

Regarding easiness to use the SWAYM platform, the majority of the learners agree (56%) or strongly agree (35%) that SWAYAM platform was very easy to use. Majority of the learners strongly agreed that the forums and chat sessions were useful, presentations (slides, audio, video) were clear and audible, and the delivery of the course was consistent with its stated objectives. A small number of respondents differed and showed their disagreement over the opinion of the majority of the respondents (Fig. 12).

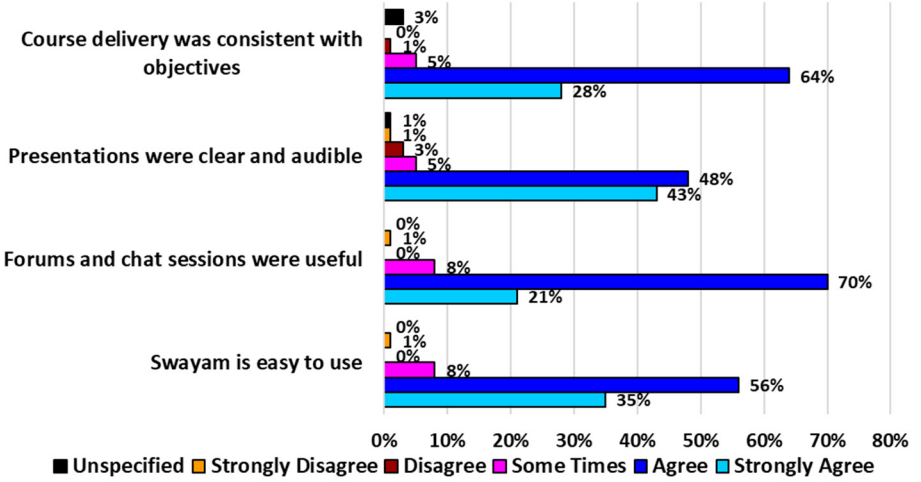


Fig. 12: Opinion of the respondents about learning experience on SWAYAM platform

3.4 Overall perception of the course

Almost all the respondents expressed their satisfaction over the quality of the course and presenter's knowledge about the subject matter and held the opinion that the course is worth recommending others. Half of the respondents expressed that they would not have taken this course if a certificate was not offered (Fig. 13).

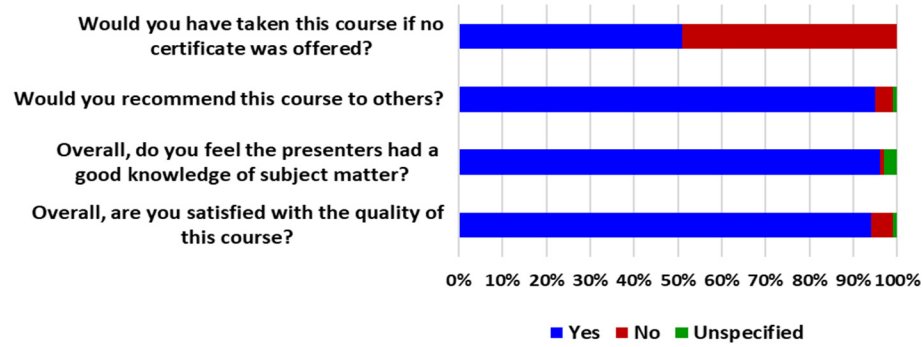


Fig. 13: Overall percption of the course

3.5 Quality of the content

Quality of the content is the major concern for any course to be successful. Feedback on the quality of the content revealed that majority of the respondents (≥89%) believed that the visuals well conveyed the intended message in all video lectures, the content of every video lecture was in accordance with the objectives of the course, the style and language used in video lectures were appropriate. Around 40 % of the respondents expressed that more scientific and difficult words were used in video lectures. This is essential feedback and could be taken care of in future.

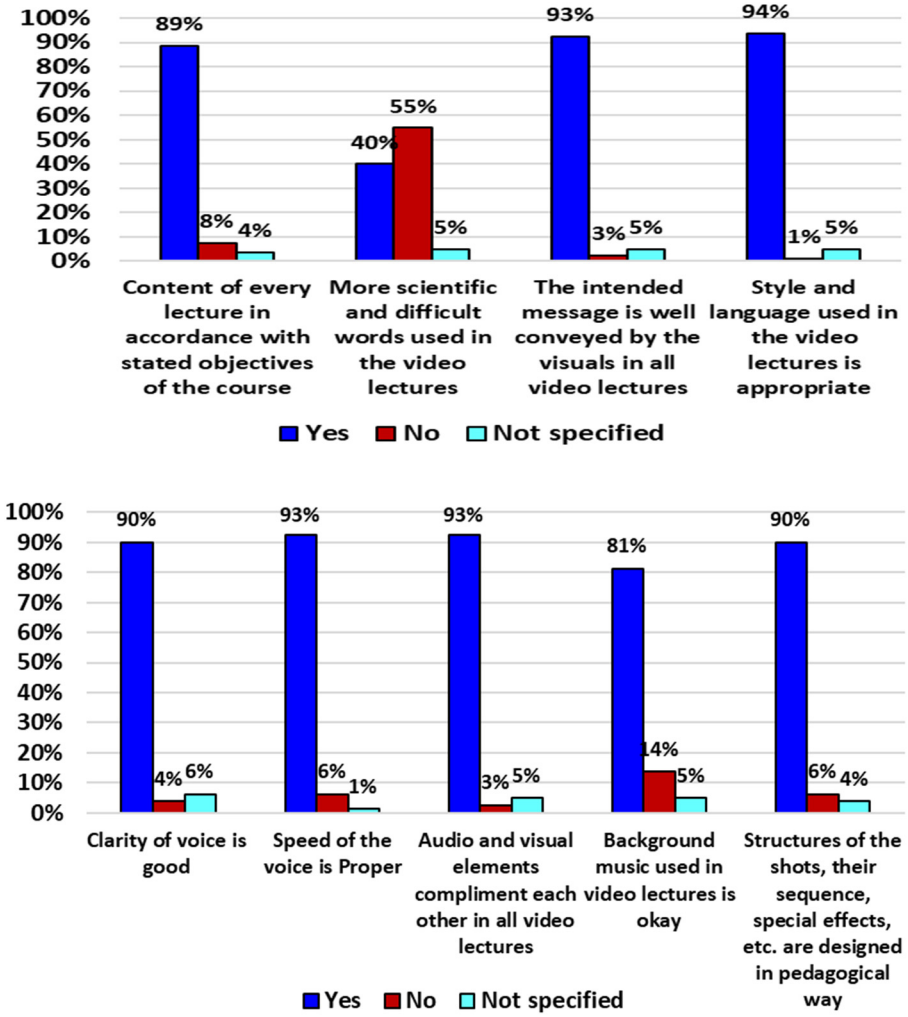


Fig. 14 : Quality of the content

Clarity and speed of the voice in video lectures was satisfactory for more than 90% of the participants. According to them, the audio and visual elements were complementary to each other in all video lectures and also structures of the shots, their sequence, special effects, etc. were designed pedagogically.

Almost 81% of the respondents were happy with the background music used in video lectures, but 14 % of the people were not comfortable with the background music used in video lectures. The background music for 2-3 video lectures was slightly loud, and the same feedback was obtained on YouTube channel where the video lectures have been uploaded. It needs to be taken care of by the MOOC developers in future.

4. Conclusion

Open universities definitely have its share in popularizing the ODL system. In India, for the last three decades, ODL system is thriving to cater to the needs of the learners who are thrown out of the traditional system of classroom teaching for one or other reason. MOOC has emerged as a new form of distance education. Surprisingly, MOOC, a form of distance education, has been initiated and popularized by the traditional educational system. No doubt, Open Universities have been tremendously successful in introducing the concept of ODL in society.

As far as agriculture through ODL system in India is concerned, with 337,000 cumulative learners, YCMOU has succeeded in elevating the social mindset towards distance learning. MOOC in agriculture is a latest addition which is even adopted by the traditional system. Therefore, it's a huge challenge to develop a quality MOOC suitable for wide range of learners. There are very few studies on assessment of MOOCS (Khalil & Ebner, 2015; Margaryan *et al*., 2015; Perris, 2015; Zheng *et al*., 2015) and in specific agricultural MOOCs (Vijaya *et al*., 2016; Mishra, 2016; Prabhuraj *et al*., 2016; Jirli *et al*., 2019).

In this attempt of assessing the first YCMOU MOOC in agriculture, it was noted that initial response in terms of enrollment was good but only 2% learners turn up to clearing the examination. In general, opinion of almost all learners reflected satisfaction over the content and technical quality of the MOOC, a few expressed their annoyance over background music and scientific words used in video lectures. More thorough and continuous assessment studies in future will provide broad base for development of quality MOOCs.

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