

**An Insight to Collaboration in MOOC**Jyoti Chauhan¹¹Department of Computer Science, University of Delhi, New Delhi, India

Abstract—Collaboration tools are incorporated in Massive Open Online Course (MOOC) to promote community based learning. These tools facilitate interaction among users to share their ideas, discuss the problems, provide feedback, and help them to work towards achieving a common learning goal. In this paper, an overview of collaboration tools is provided by covering various aspects including users and types of tools, basis for choosing a type of tool, and relation among them. Here, some of the most commonly used collaboration tools in MOOC are explained briefly, with a special focus on the communication tools. Also, the implication and issues related to the tools are discussed here.

Keywords- MOOC; Collaboration Tools; Collaborative Learning; Communication Tool; Higher education

I. INTRODUCTION

Online learning delivers education in the form of instructions. For offering these instructions, various learning methodologies and pedagogical practices are used. Over the last decade, with the technological advancement, the learning practices have also gone under lots of changes. Now learning is no more just the delivery of instruction by the instructors in different formats. But the delivered instructions currently support different learning methodologies and pedagogical theories such as, theory of behaviorism, instructivism, connectivism, social constructivism. Use of these practices have shifted the focus from teacher centered learning to the student centered learning. Learning systems including Massive Open Online Course (MOOC) has also evolved to allow delivery of these kinds of instructions to support different pedagogical practices.

Currently, MOOC is the popular way of offering online courses and used globally. MOOC courses are designed to support unlimited (logically) participation and can be accessed from anywhere via internet. It has gained lot of popularity since the time of its development in 2008. Some of the popular MOOC providers are, Coursera¹, edX², Udacity³, iversity4, FutureLearn5, NovoEd⁶. As of December 2016, approximately 58 million students are registered for the MOOC courses, offered by more than 700 universities and approximately 6850 courses [1]. Since, MOOC learners belong to different countries, cultures, languages and educational qualification; resulting in diverse social, communication and domain specific skills among learner. In order to fill this gap of diversity, MOOC are continuously improving the content, delivery methods, feature of the platform etc.

MOOC supports connectivism and social-constructivist learning methodology providing informal ways of learning. In general, MOOC platform provides integrated tools for collaboration, residing within the platform itself. Alternatively, the provider can use some third party tools that are external to the platform to offer collaboration functionality to the MOOC learners. For example, Coursera uses Google handout⁷, a tool provided by Google for face to face interaction.

Collaboration tools in MOOC facilitate the users to interact with their peers, and help them to learn in a collaborative environment. In these kinds of scenarios, learning emerges from connections between students in a spontaneous way [2]. Here, information is created by different activities of the learner like, commenting, responding, updating, and sharing. It enhances participation among learners and improves performance [3]. Collaboration tools help to establish the learning communities online and brings participants together to support learning of each participant though promotes creativity and critical thinking [4].

In this paper, the focus is on providing an insight to the collaboration in MOOC that is provided using the tools. For the purpose, an introduction about the collaboration in MOOC is given. Here, author explains various aspects of the collaboration in context of MOOC. It includes the discussion of different users of tools, types of tools, and relation exist among tool, type and users of collaboration tools provided in MOOC. Author has classified the type of collaboration tools used in MOOC, into several categories based on several parameters involved. For example, based on the time of communication, tools are categorized as- a) *Synchronous* and b) *Asynchronous*; based on the kind of users involved in the interaction, the tool supports two types of interaction- a) *Learner-Learner* and b) *Learner-Instructor*; and depending on the number of users involved in the interaction, it can be - a) *One to One*, b) *Many to One*, and c) *One to Many*. Furthermore, with the explanation of various collaboration tools provided in MOOC, author has mentioned the category of communication tools, separately, as they are integral part of the collaboration serving specifically for interaction. Also, some technical implications and issues are also mentioned here. Explanation of the collaboration tool and of related aspects, as provided here, can help the platform provider and course instructor to have a better understanding of each of the

collaboration tool and their requirement. It will influence the selection of tool (s) for collaboration by differentiating each tool according to the needs.

In this paper, Section II provides an overview of the collaboration in MOOC. Section III explains the users of the collaboration tools in MOOC. Section IV explains different types of the collaboration tools provided in MOOC. Section V discusses some of the collaboration tools commonly offered by the MOOC providers. Section VI establishes the relation between the tool and types of collaboration discussed in previous two sections. Section VII explains some technical implication and issue regarding the tools. Section VIII states the conclusion.

II. COLLABORATION IN MOOC

In educational settings, collaboration tools are designed to support the idea of community based learning. Mainly, the collaborative learning supports the informal ways of learning. The idea behind collaborative learning is that learning can never happen in isolation but proceeds with the cooperation of the peers. In learning environment, this kind of scenario occurs when a community of participants may want to work together on a project towards achieving a common learning goal. Furthermore, collaboration and communication competencies are considered as the essential elements [5] and skills of the 21st century [6], a variety of tools deliver these features for learning. Therefore, collaboration tools are used to provide a cooperative learning environment that supports collaboration, communication and connections as the essential and core elements of learning. Communication tools help the users to interact with an individual, a group of peers, and/or the course instructor. Some studies observed positive effects of more peer interactions in academic performance of participant [7] [8]. The main objective of collaborative learning practice is to create learning and provide a lifelong learning experience.

Due to massive nature of MOOC, their audience belongs to diverse profiles. Learners are from across the globe - different countries, cultures, languages and educational qualification, which results in diverse social, communication and domain specific skills. In order to fill this gap of diversity, it is necessary to allow the learners to learn at their own pace and in their own way. One of the methods is to provide better communication means to interact with the instructor or with the peer groups. Other techniques are also used that allows learners to work in cooperative manner and guide each other in learning path; making strong connections inside the learning environment as well as with the outside world.

MOOCs are built upon the theory of connectivism and social constructivist, supporting the social and collaborative learning practice. MOOC offers a range of collaboration tools. Some of these tools are integrated within the MOOC platform, depending on the built-in capabilities of the platform. However, an instructor may also provide some alternative tools (third party tools), external to the platform to include collaborative and communication competencies in the course.

Collaborative MOOC system provides a single platform for the course participants to create better learning resources, use the knowledge of existing participants, and do various learning activities in a cooperative manner. Collaboration tools facilitate the users to express their thoughts, opinions, and help them connect irrespective of their time and location. It changes the passive role of learner from information consumers to the more active one by providing them the opportunity to produce better learning material. In collaborative learning scenario, the learners help their peers to understand and share their knowledge, within the learning system. Comments and feedbacks are also provided sometimes.

Some of the collaboration tools offered by MOOC are discussion forum, wiki and blog. They are used for starting a discussion on course-specific issue and also to create learning resources.

III. USERS OF COLLABORATION TOOLS

MOOC courses are delivered via the MOOC platform, which is provided by the provider. The provider is responsible for controlling the features or tools to be provided to users of the MOOC. The users either use the MOOC platform to deliver a course or to learn from it. Here, we focus on the users who use the services or features offered by MOOC providers.

In MOOC, there are several kinds of users who interact with the collaboration tools. They use the tools to interact with other users, and work in a collaborative manner to create information by posting, editing, sharing and providing feedbacks. We have identified three main users of the collaboration tools in MOOC, which are as follows-

- **Instructor** is a person who is responsible for designing and delivery of the course. Instructor is also liable to control the tools by defining various settings, parameters specific to the tool. So, instructor is sometimes called as administrator of the course. Also, instructor moderates all tools and activities in the course, to provide collaborative environment. Instructor also plays a role of a passive coordinator whose task is to monitor the activities of the user.
- **Learner** is a person who simply uses the tools offered by the instructor or course provider. Learner use these tools to create new information or view existing one; share information with peers, groups or outside world; search for text; provide feedback by commenting, voting, liking etc. Learners can work collaboratively to modify a single document or can create a new document.

- **Group** is a set of participants who work together for a common purpose. These smaller communities are created in a MOOC course to deliver a special and/or different learning experience. Collaboration tools are offered mainly for the group of users.

Learner in quiz can be a single person or a group of learners depending on the type of tools, their parameters, and the activity defined by the instructor. Though, the instructor can only offer the tools that are provided by the platform provider, yet they can enable or disable the tools to make them available or unavailable for the learners. Also, the instructor defines properties of tools as per their requirement.

IV. TYPES OF COLLABORTION TOOLS

A MOOC platform is delivered MOOC supports various types of collaboration tools. The goal of providing the tool is to create compelling but not compulsory learning activities [9]. Each of the tools serves for a specific purpose and has their pros and cons, which also need to be considered while offering a tool for learner. The tools can be divided into several categories, based on different basis they are used for.

A key to successful collaboration is being able to provide effective communication by engaging learners. Therefore, collaboration is not possible without existence of communication. Generally, communication tools are categorized into two types - synchronous and asynchronous based on the time of the communication.

- **Synchronous Communication Tool:** It allows the users to communicate in real time with anyone across the globe. It provides the users the ability to share their ideas, gaining support and reaching agreements by instant feedbacks. It allows learners to be working collaboratively on documents for class, and at the same time have the option to be communicating synchronously if necessary. It involves text, voice, video, live document sharing, etc. Some of the tools used for synchronous communication are Chat (text or voice), Video Conferencing etc.
- **Asynchronous Communication Tool:** It facilitates a user to interact in a different time setting without the expectation of immediate feedback. It supports “non-real time” communication. It facilitates a learning environment where peer-to-peer interaction, discussion, and self-paced learning is encouraged. These tools allow the transfer of knowledge digitally and maintain an archive of all communication, interaction, and shared projects. It includes email, blogs, wikis, e-portfolio, discussion forum, and many more.

Presently, asynchronous communication tools seem to be more widely used in any online learning including MOOC. It may be due to cost issue, user preference, and lower implementation barrier, as compared to synchronous tools of communication.

In any class, it's important to have interaction, both learner to learner, and instructor to learner. Based on the similar concept, Michael Moore's [10] defined a model for interaction among in educational context. It includes learner-learner and learner- instructor as the critical interaction components.

- **Learner-Learner Interaction:** The focus of learner-learner interaction is to use the massiveness of learners to attain the learning goals, together. Such tools are required to discuss their ideas, problems, working progress of the common project, peer assessment, etc. It depends upon the motivation and requirement of the learners, to interact and choose the tool for interaction among available ones. It involves either or both asynchronous and synchronous interactions in text, audio, video, to be used in the course. Some of the tools used by learner to interact with their peers are wiki, e-portfolio, chat, message, and discussion forum.
- **Learner-Instructor Interaction:** It provides opportunity to the learner to have a teacher (instructor), by allowing them to reach the instructor for their problems or questions. Though a formal instructor is always assigned for the course, yet instructor is made available as mentor, coordinator, and teacher at different levels of the course. In general, asynchronous tools are used for learner-instructor interaction as for larger class, the less instructor to learner interaction occurs. Instructor mainly prefers email to interact with the learner that can be an individual or a group. While a learner use the discussion forum to pose their question and gain attention of instructor towards the problem.

In these kind of interactions (explained above), the direction of interaction is not considered. For example, interaction of learner-instructor is same as of instructor-learner. These types only reflect the user involved in the interaction not the direction of the interaction flow.

Moreover, it is possible to interact with an individual or a group of person, while interaction is occurring between learner-learner or learner-instructor. Therefore, three types of interaction can be possible, based on the number of users involved.

- **One to One Interaction:** In this kind of interaction the user can be anyone, a learner or instructor leading to the learner-learner interaction and learner-instructor interaction, explained above. By default all tools support one to one interaction due to minimal requirement of any interaction tool.

- **Many to One Interaction:** It is a common scenario that occurs when all learners communicate with their instructor by asking question that are emailed, messaged, or posted on discussion forum. Here, “many” is not necessarily to be for massive number of users.
- **One to Many Interaction:** It is commonly occur with instructor-learner interaction where the instructor have to answer the questions of all the learners that are sent via discussion forum, email, message tools, and also instructor provide the information to reach to many learner via email or message tool. Moreover, a learner can also provide any information or broadcast a message for many learners using chat room, wiki, e-portfolio etc.

Here the learner can be an individual (one) or a group of person (many), but the instructor will always be one who is assigned for a course. However, in a larger class instructors are fewer or not sufficient to interact with each learner. Too many users in the MOOC, sending messages to the learner or instructor, can be overwhelming. So, the tools can be designed to limit the number of notifications or the information that will be more useful. These tools are well-designed encouraging the interaction without overwhelming the learners with the information.

V. COLLABORATION TOOLS IN MOOC

For incorporating the collaboration element in the MOOC, several tools and software are used. Some of these tools are specifically used for communication purpose to provide an effective interaction among different users. As communication is the integral part of collaboration, a specific category is mentioned for the communication tools that are commonly used and supports collaboration in MOOC.

Moreover, MOOC provides collaboration tools to allowing mutual work. The community of learners registered in MOOC course assists their partners, and to enrich the course with discussions and related contents as a way of crowd sourcing [11]. MOOC offers various collaborative learning tools such as, discussion forum. These tools facilitate learners to work on a single project in order to attain common learning goal. Also, learners can discuss, share the ideas for clarify on any course related problem.

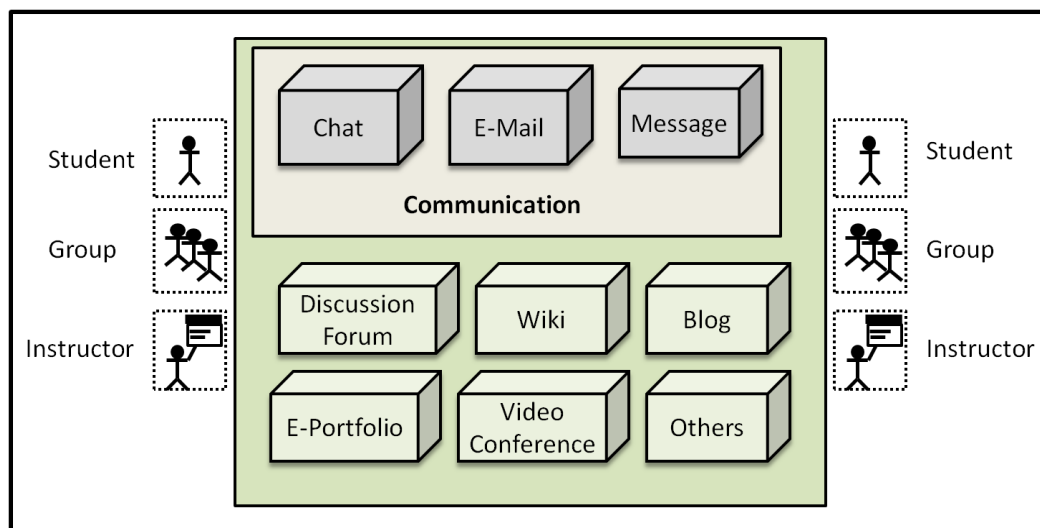


Fig. 1. Various collaboration tools in MOOC

Fig. 1 shows different tools used for collaboration in MOOC. The tools are provided by the MOOC platform. The learner and instructor use these tools for collaborative experience. The following subsections briefly describe the collaborative tools commonly used in MOOC.

4.1. Communication

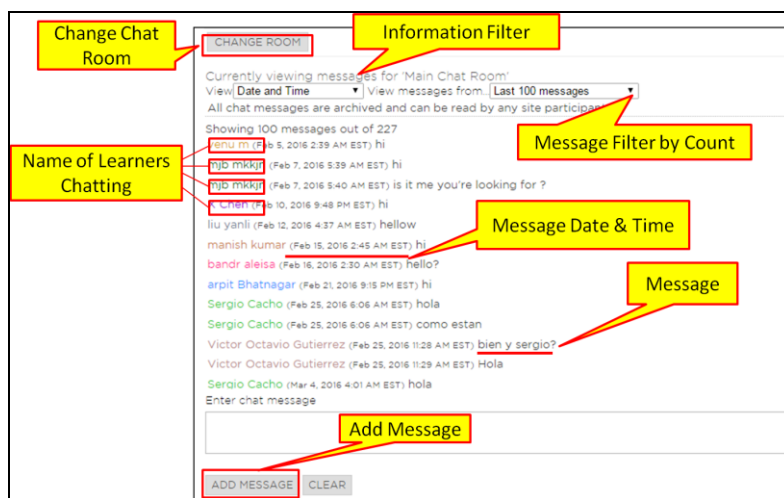
MOOC supports communication tools for providing interaction facility. The communication tool can either be synchronous or asynchronous, or can belong to any of the categories explained above, based on the kind of interaction they offer. Here, the communication tools that are supported and provided by the MOOC platform are considered, only, not including the general tools of communication. In general, these tools are bound to the course site of the platform. Some of the commonly used tools are explained as follows.

4.1.1. Chat

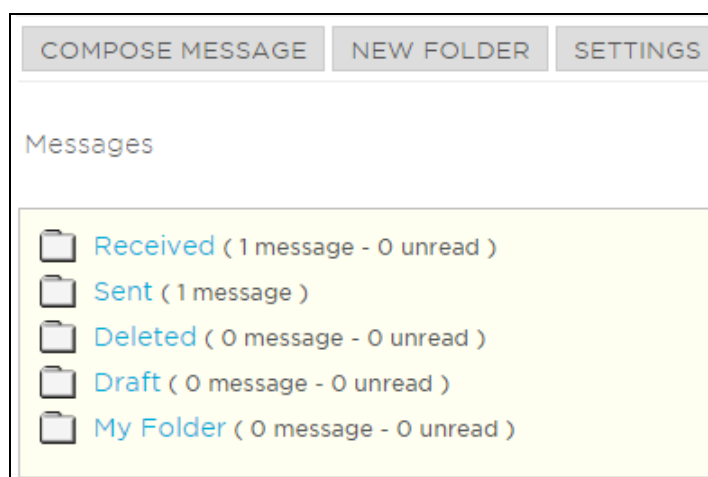
It is a text-based tool used for real time interaction among the participants. Only enrolled learners of the course can use this tool. Chat tool also provides an isolated setting for groups of learners via chat rooms. Each enrolled learner can see

the peers available for interaction (online) inside the chat room and also get notified for any new member. All content of the chat can be viewed by any of the enrolled learner. Chat tool does not support private chat for an individual learner.

Chat tool allows users to communicate with other by sending messages using the chat window. Users can filter message details to be displayed on chat window. View of the messages can be modified by applying options, like, show only <count> messages, messages of last <count> days. The message sent by a user is visible to all other users available in that chat room. Users may change their chat room by selecting from the list of available rooms. Fig.3 a) shows some of the options and controls (highlighted) provided by the chat room tool.



a)



b)

Fig. 2. Several options and controls provided by Sakai platform for- a) Chat room tool, and b) Message tool.

4.1.2. Email

It facilitates the user to send email messages to course participants as well as to non-site users. Generally, email is used for formal communication. In some MOOC courses, email is widely used by the instructors to notify course related information and news to the learners. The email tool uses the external email address of the sender entered at the time of account registration. For sending an email, the sender doesn't need to go to the email provider like, gmail and hotmail, but uses the email facility provided in the MOOC platform.

Email can be sent to an individual or to a group of people. There are options to attach file, add email address of receiver. For sending email to non-site users, one needs to add recipient email address. For registered site users, the email can be sent by selecting roles of the members (system automatically adds registered email address saved in the account of the user based on the role). The email can also be archived.

4.1.3. Message

It is used as an internal message transfer system for exchanging messages with individuals and/or group of users. It allows communicating with a course, group, individual student or a group of student at any time. It is suited for informal communication to exchange private messages. Some may use it as an alternative to email tool.

A message tool can be used to send message to a specific course participant or to all, by their role, course category etc. Some message tool providers also give the option of attaching a file with message. In addition to composing a message, users can edit, delete, reply (one/all), forward and search the message. By default, each course site provides a message center that records messages in different categories such as, sent, received, and deleted. Also, a user is allowed to create a folder to store messages.

Though message and email tools share some features that allow one to be used instead of the other, but both have significant differences. Firstly, message cannot be sent to the users outside the learning system. Message does not allow using external email address, which makes the tool useful only for internal communication. Also, email is sent via the internet while message remains within the system.

Moreover, MOOC provides some collaboration tools to allow the learners to work in cooperation with their peers. MOOC offers various collaborative learning tools, for example, discussion forum, wiki, blog etc. All these tools are not specific to the course like the communication tools. Some of the tools are associated with course site, for ex, wiki; while the blog and e-portfolio tools associated with the user or the MOOC platform and does not change with each course user enroll for.

4.2. Discussion Forum

It is one the most common tools offered by MOOCs to exchange the idea on common interests with the learning community exists inside the learning environment. It can be used by learner and/or instructor to build collaborative environment for learning. Discussion forums centralize the contributions, discussions, opinions on a selected topic. Instructor is responsible to start a discussion and define discussion topic, maintain it, and make comments on learners' observations issues raised by the discussion.

Discussion forum tool provides the opportunity to the user, to start a discussion, initiate it by asking question, contribute to the forum by giving answer, comment, and feedback, using the controls by provided by the tool. Fig. 4 is showing various controls and options provided by the edX platform. Forum maintains hierarchy of the discussion threads. Generally, each forum have post on which anyone can provides response and one those responses participant can provide their feedbacks in the form of comment. Some of the MOOC course also uses graded discussion where it is compulsory for the learner to participate. All these discussion can be viewed in the discussion list with various details. Discussion forum also enhances networking opportunities and increase opportunities for consultation and collaboration with other professionals [12].

4.3. Wiki

It supports collaborative work by allowing users to author, change, correct web pages without knowledge of Hyper Text Markup Language (HTML). It provides a single platform for the people seeking for common learning goal and helps each other towards achieving it. Wiki are used to show case the knowledge comprehends by the course and exchange the information between group and educational organization. It also encourages use of project based learning.

Wikis allows the exchange of the information with groups exist inside the learning settings as well as with outside world.

Wiki tools allow course participants to create the learning resource in the form of web site. User can use different control provided on the wiki page, like, add, edit, delete article. Some of these controls are shown in Fig 5. Wiki also stores all versions of the documents with modification details and allows managing changes using controls (for ex, previous version, revert changes etc.). Participants are notified for any change in the document to keep them updated with the information.

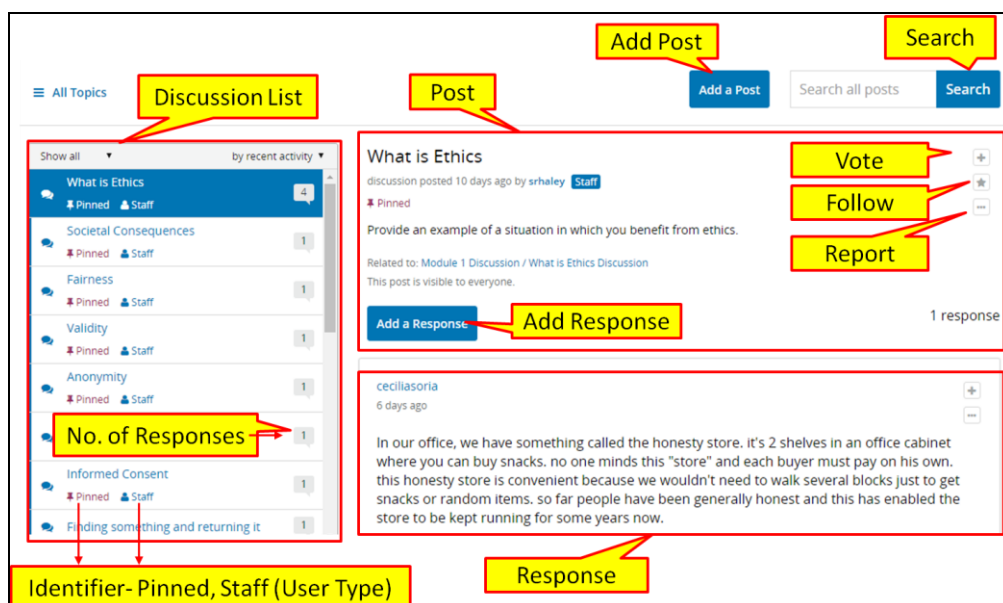


Fig. 3. Option and controls (highlighted) offered by discussion forum of edX platform.

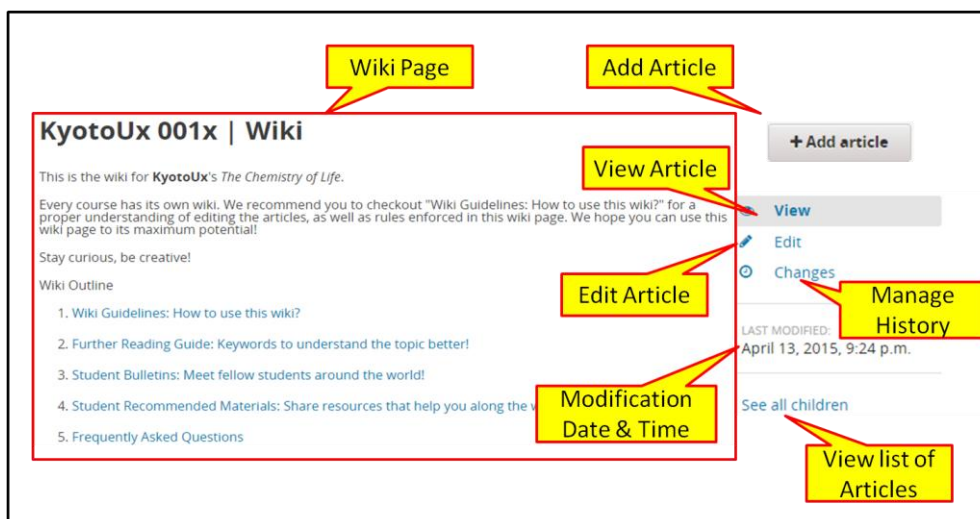


Fig. 4. Option and controls (highlighted) provided by wiki of edX platform.

4.4. Blog

It is offered by the MOOC to share information corresponding to the courses offered. In MOOC, these are not much effective and popular tools comparing with the other discussed in the same category. Some MOOC providers generally use third party blogging software such as, Wordpress.com, blogger.com etc. Even one of the popular MOOC provider edX uses wordpress.com for offering blog feature.

Blog tool allow the registered users to share their ideas, suggestion and comments on any information provided. A blog provides support to a range of file types from text to media. The blog sites are regularly updated to display new information and reflect the contributed suggestion of the participants.

4.5. E-portfolio

It is probably the most recent addition to the family of collaboration tools in MOOC. It provides a platform to display academic work, for example, any project, knowledge over a specific area etc.; or to share personal information, like, resume, a simple subjective web site (like, my blog). The e-portfolio can be kept private to the user or can be made available to the public to be viewed by everyone.

E-portfolio provides a place to the learner's for showcasing their work. The content is divided into sections and pages by the e-portfolio. Learners use various forms of content in e-portfolios such as, text, images, presentations, video, audio, links, and a discussion space to demonstrate proficiency in a specific subject matter [13] [14] [15]. Some providers may also allow downloading the content to view it without accessing the e-portfolio site.

4.6. Video Conferencing

It is a synchronous tool for discussions. The sessions for video conferencing are created by the course instructor that can be joined by any learner. In MOOC, providers use the existing open source or third party video conferencing tools. For example, Open edX uses Google hangout and Canvas/Sakai use BigBlueButton⁸. Each software has its own limitation, like, Google hangout allows maximum 10 users at a time that may vary with the advanced versions. Table 1 lists some of the popular tools used for video conferencing in MOOC.

Generally the conferencing settings are provided course wide. Learner can get benefit with the presence of instructor by interacting with them. Some MOOC platforms also allow learners to set up their own conferences in course groups specific to a course unit.

Table 1. Some of the popular tools and software used by the MOOC platform for video conferencing.

Information	Open edX	Canvas	Sakai
Tool Name	Instant Hangout	Conference	Meeting
Open-Source or Proprietary	Proprietary	Open-Source	Open-Source
Software	Google hangouts	BigBlueButton	BigBlueButton
Limitation	Max 10 Users	Max 50 Users	Max 50 Users

Video conferencing tool provides an interface to the participants for managing the interaction. It provides various controls for airing the video and/or audio and sharing files, presentations or other resources. It also allows recording of the conference. We have published the list of features of a video interface in our previous article [16]

4.7. Others

MOOC allows some external collaboration tools to be incorporated within the MOOC in order to improve the collaboration. The tools like, Google docs, Google drive allows multiple users to work on the same document. All users will access single copy of the document that always reflects changes in real time. In MOOC, instructor generally uses these tools to share attendance sheets, extra learning resources, creating a group projects etc.

VI. COLLABORATION TOOLS AND TYPES : CORRELATION

Different tools are used in MOOC to provide collaborative and interactive learning environment to their users. Some of the commonly used tools in a learning environment including MOOC are chat, email, message, discussion forum, wiki, blog, e-portfolio, video conferencing. From the discussion above, it is clear that each of these tools serves a specific purpose in MOOC. Moreover, there are also related with one or more categories or type of the tools, mentioned in the paper. For example, chat is synchronous tool used by the learners, where learner can be one or many supporting the one to one and one to many interactions among learners. Similarly, each tool fall in to one or more categories based on their features. The relation of each tool with different categories is summarized in table 2.

A brief introduction of the tools and their relation with different categories, as explained in this section, provides a clear understanding about the tools commonly used by the MOOC providers for collaboration. Also, it can help the provider in selecting the tool as per their needs. For example, the platform provider may have need to provide the communication among instructor and learner, which is possible with the email by sending mails to dedicated person (instructor), and discussion forum tool by posting the question. Also, the message tool can be used that is provided by some of the platform allowing the learner to communicate with their instructor using the tool provided in the platform itself. Therefore, platform providers will have a clear ground of understanding from here to choose the appropriate tool based on their needs.

Table 2. Some of the popular tools and software used by MOOC platform for video conferencing.

Tool Name	Type /Category Supported
Chat	Synchronous, L-L {O-O, O-M (Chat room)}
Email	Asynchronous, L-L {O-O, O-M, M-O}, L-I {O-O, M-O}
Message	Asynchronous, L-L {O-O,M-O,O-M}, L-I {O-O, M-O}
Discussion Forum	Asynchronous, L-L {O-M}, L-I {M-O}
Wiki	Asynchronous, L-L {O-M}
Blog	Asynchronous, L-L {O-M}
E-Portfolios	Asynchronous, L-L {O-O, O-M}
Video Conferencing	Synchronous, I-L (Common Conference), L-L (Personal Conference)
Learner-Learner (L-L), Learner-Instructor (L-I) One-One (O-O), Many-One (M-O), One-Many(O-M)	

VII. IMPLICATION AND ISSUES OF TOOLS

For providing the collaboration functionality in the MOOC, various software and tools are used. Though there are various tools that are already incorporated in MOOC platform as well as provided by the third party providers for ready to be used. Still, there are certain points of concern that need to be considered while providing any tool to the MOOC users. First and very basic thing is to ensure the extent to which technical assistance is required in terms of the equipments or devices. For example, Do web camera and/or microphone for video conferencing is available with all the participants of the course?. It requires the provider to be familiar with the learner's profiles, to provide them the tools, only, for which most of the users are technically ready to use. Secondly, the provider needs to make sure about; to what extent the technical assistance is possible to be provider to the learner, for instance, the tools requiring the instructor to provide their feedbacks. It is not always possible for a single instructor to respond, to all number learners and available at all time, due to massiveness of the learners. Next, consider the need of the alternate solution or the resources that need to be made available in case any problem occur or the problem reported by a specific group of people such as, with hearing disability

(need caption), visually challenged (need hearing aids). Lastly, the MOOC provider and instructor need to use the right mix of tools to not overwhelm the users by much information and at the same time supports the required collaboration.

VIII. CONCLUSION

MOOC provided collaboration tools to promote community based learning supporting the informal ways of learning. An instructor offers the tools and activity for collaboration, by considering several characteristics such as, defining the type of tools, enable/disable specific features, mention specific parameters of tool as number of users in video conferencing, allowing personal conference or not, allowing only view or download or change in a shared document etc. To set up a ground for understanding the collaboration tools in MOOC, a discussion is provided in detail for the users of the tools, different types of tools, basis for selection of type of tool, and the relationship among them used. Furthermore, while providing the collaboration tool and defining properties, the instructor as well as platform provider needs to consider some points regarding the implication of the tools, some of them are mentioned here. We shall see further disruption as well as innovation in terms of the tool supported and their types, with some more advance features in the collaboration tools specifically for MOOC in future.

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