

## **A Timed Discussion Forum for Novice Users and Self-Learners of Spoken Tutorials**

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*Spoken Tutorials are an instructional methodology to train students on IT topics at a national level through self-learning. Problems that beginner users face in accessing information from online resources are explained. A timed online discussion forum, through which users of Spoken Tutorials can ask their questions, and also learn from previous discussions, is presented. In this Timed Question and Answer Forum, learners access information by pinpointing the exact time of the Spoken Tutorial at which one may have questions. This forum is helpful not only to the beginners, but also to other learners who participate in massive distributed workshops as well. Discussions in this forum double as document/FAQ for the software.*

*Keywords: discussion forum for beginners, question and answer forum, collaborative content generation, learner centric MOOCs*

### **INTRODUCTION**

Employability of students is very low in India (Farrell et al., 2005). This can be partly addressed if we can tackle the problem of low computer programming competency (Gadgets-Now, 2017). The Spoken Tutorial project was started to help improve programming skills of students (Moudgalya, 2017, 2014; Eranki and Moudgalya, 2016; Moudgalya, 2011). Spoken Tutorials are a series of audio-video tutorials of 10 minute duration each.

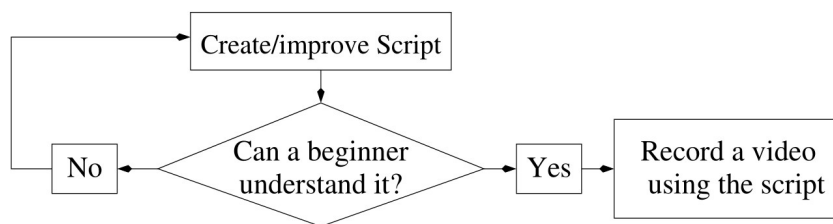
As many students in India do not have access to good education, self-learnability is accorded the maximum priority in the creation of Spoken Tutorials. To achieve this goal, video tutorials are created using scripts that pass a novice check, as shown in Fig. 1. Some other steps undertaken to make Spoken Tutorials accessible to the disadvantaged student community are: (1) Audio is dubbed into all 22 official languages of India, keeping videos in English - this helps students who are not fluent in English, without sacrificing

employment opportunities (2) Facilitating offline use by providing a zip file of tutorials on one or more topics (3) Focusing only on open source software, which obviates the need to buy commercial software (4) Releasing the Spoken Tutorials under the CC-BY-SA license.

There are a total of about 1,100 Spoken Tutorials, covering about 75 topics. Including dubbing, there are about 11,000 Spoken Tutorials. Using Spoken Tutorials, more than 6 million college students have been trained during the past 6-7 years (Moudgalya, 2017; Spoken-Tutorial-Team, 2021). Students trained through this self-learning method have been performing well (Moudgalya et al., 2019; Moudgalya, 2018).

Given the great potential that Spoken Tutorial has (Eranki and Moudgalya, 2016), it is important to provide an online forum for the target audience to interact, and to clear their doubts. This work presents some difficulties that beginners face in using forums in Section 2, and our solution in Section 3. Unexpected benefits of this forum to other segments of the population are explained in Section 4.

**FIGURE 1**  
**NOVICE CHECK OF SCRIPT HELPS IN SELF LEARNING OF SPOKEN TUTORIALS**



### DESIRED FEATURES OF FORUMS FROM BEGINNERS' PERSPECTIVE

**1. Friendliness:** Most Internet forums demand certain netiquettes. While some forums are tolerant, others are not, and may result in nasty responses (Wikipedia, 2021). To a beginner, learning to use Free and Open Source Software (FOSS), this is a formidable challenge. Usage of FOSS requires a higher competence or having a community that is willing to help beginners without being rude (Schafer and Krazlmuller, 2007). The need to keep forums friendly as a long-term survival strategy has been articulated, however (Fogel, 2017).

**2. Reading before posting:** Forums also ask the user to search before asking a new question. Sadly, forums become overwhelming and confusing for users to navigate, especially for low Internet efficacy users. Students with high Internet efficacy learn to do this better, however (Balaji and Chakrabarti, 2010). Novices behave differently from experts, and they need help to locate the information available on the Internet (Lu and Hsiao, 2016; Lu et al., 2016). Unfortunately, however, they don't necessarily get helped, as Internet users are more rude online than they are in person (Betkowski, 2021). If they don't use the forums well, beginners lose out (Nandi et al., 2011).

**3. Constructing useful content out of online collaboration:** The popular forum Stack Overflow has been suggested by many as a useful learning tool (Dondio and Shaheen, 2019). Nevertheless, the main weakness of online tutorials, manuals, FAQs, wikis, bulletin boards, and weblogs that form the documentation for FOSS, is that they are incoherent, unorganized, and incomplete (Schafer and Krazlmuller, 2007; Levesque, 2005). The problem of documentation cannot be solved on a technological level, but by using different methods of storing and retrieving information, in a way consistent with cultural practices (Schafer and Krazlmuller, 2007).

Micro-learning is proposed as a way to learn FOSS, and to acquire knowledge in small steps to construct a broad and deep knowledge eventually (Schafer and Krazlmuller, 2007). Ten minute long Spoken Tutorials, which are in a sense a documentation to open source software, are a step in this direction. It will be interesting if we can organize discussions that happen in carefully designed forums to produce useful content. Collaboratively created documentation for Scilab is available through the Textbook Companion project (Braatz, 2014).

## IMPLEMENTATION OF A FORUM WITH DESIRED FEATURES

Keeping the requirements stated in the previous section, we have designed and implemented a forum to provide answers to questions, on the basis of the time of occurrence in the Spoken Tutorial (Spoken-Tutorial-Team, 2021). We will refer to it as the Timed Question-and-Answer (QnA) Forum.

Django, MySQL database, Bootstrap, HTML 5, CSS 3 were the technologies used to create the Timed QnA Forum. As the Spoken Tutorial website (Spoken-Tutorial-Team, 2021) is in Django, one could log into it and the Forum through a single sign on with a common user login. The ST video ID is mapped with each Forum question. So the questions can be fetched accurately in both online and offline playback. Fetching of questions is done through AJAX calls, wherein the Spoken Tutorial website (Spoken-Tutorial-Team, 2021) acts as an API that feeds the tutorial names into the Post Question form.

Whenever a question is posted, all contributors/authors of the Spoken Tutorial are notified. Subsequently, follow-up mails are also sent as reminders to the authors. The learner who posted the question is also notified when the question is answered. The same is also visible immediately online on the Forum.

On the Timed QnA Forum webpage, a slider displays all the software series in graphic form. By clicking on any one of these, one can access all the previously asked questions posted in Forums, till date, for that particular software series. On the homepage, the 10 most recently posted questions are displayed and these are arranged in a chronological order, with the most recent question appearing first. The columns are sortable in ascending and descending order. A typical set of questions asked on the forum is displayed in Fig. 2 (Left).

**FIGURE 2**  
**A TYPICAL SET OF QUESTIONS AS IT APPEARS ON THE TIMED QNA FORUM (LEFT)**  
**AND THE RESULT WHEN THE LENS NEXT TO MOODLE IS CLICKED (RIGHT)**

FOSS ↕	Tutorial ↕	Min ↕	Sec ↕	Question ↕	Date
Moodle-Lear... Q	Installing-... Q	05-06	40-50	Two parts of Moodle series	16-09-20
Moodle-Lear... Q	Getting-Rea... Q	05-06	20-30	OS and Software for Moodle installation	16-09-20
What-is-Spo... Q	General Q	None	None	About learning	16-09-20
Moodle-Lear... Q	Installing-... Q	15-16	50-60	i did not change the Database user name...	16-09-20
Scilab Q	Scripts-and... Q	03-04	20-30	Present working directory	15-09-20

Foss	Tutorial Name	Mins	Secs	Title
Moodle-Lear... Q	Installing-... Q	05-06	40-50	Two parts of Moodle series
Moodle-Lear... Q	Getting-Rea... Q	05-06	20-30	OS and Software for Moodle installation
Moodle-Lear... Q	Installing-... Q	15-16	50-60	i did not change the Database user name.
Moodle-Lear... Q	Getting-Rea... Q	00-01	0-10	INSTALLATION
Moodle-Lear... Q	Getting-Rea... Q	11-12	50-60	Installation of moodle shows error on W...
Moodle-Lear... Q	Installing-... Q	09-10	20-30	Apache server is not starting

Magnifying glass icons are provided below the software series name and tutorial name. Clicking on the magnifying glass icon below the software series name, shows a list of all the tutorial names on which questions were posted, in alphabetical order. Clicking on the magnifying glass icon below the tutorial name, shows a list of all the questions posted. For example, on clicking the lens next to Moodle in Fig. 2 (left), we obtain the figure on the right. On clicking the lens next to a tutorial name, one can see all the questions posted on it. For example, on clicking the lens next to Getting Ready in Fig. 2, we obtain Fig. 3 (left). Now, one can sort the questions in chronological order. By clicking the Mins (Minutes) button in Fig. 3 (left), one can sort the questions in ascending minutes, as shown in Fig. 3 (right).

**FIGURE 3**

**ON CLICKING THE LENS SYMBOL NEXT TO *GETTING READY* IN FIG. 2, WE OBTAIN THE FIGURE ON THE LEFT, WHICH DISPLAYS THE QUESTIONS ON THIS TUTORIAL ONLY. ON CLICKING *MIN* (MINUTES) IN THIS FIGURE, QUESTIONS GET ARRANGED CHRONOLOGICALLY (RIGHT)**

Foss	Tutorial Name	Mins	Secs	Title
Moodle-Lear... Q	Getting-Rea... Q	05-06	20-30	OS and Software for Moodle installation
Moodle-Lear... Q	Getting-Rea... Q	00-01	0-10	INSTALLATION
Moodle-Lear... Q	Getting-Rea... Q	11-12	50-60	Installation of moodle shows error on W...
Moodle-Lear... Q	Getting-Rea... Q	02-03	20-30	Unable to XAMPP
Moodle-Lear... Q	Getting-Rea... Q	02-03	50-60	installation

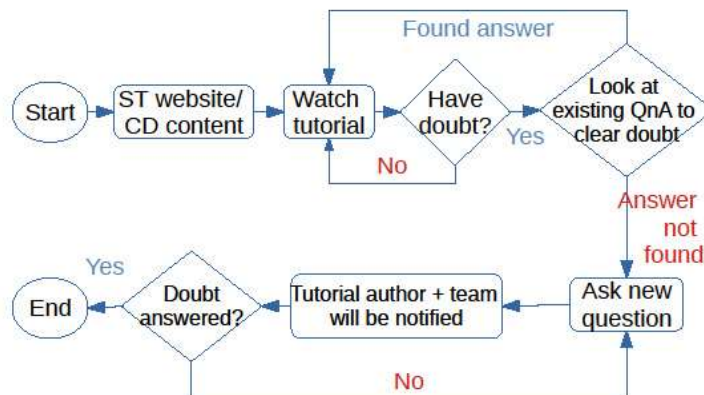
Moodle-Lear... Q	Getting-Rea... Q	00-01	0-10	INSTALLATION
Moodle-Lear... Q	Getting-Rea... Q	00-01	10-20	Installation
Moodle-Lear... Q	Getting-Rea... Q	01-02	0-10	localhost problem
Moodle-Lear... Q	Getting-Rea... Q	01-02	10-20	Moodle site registratic
Moodle-Lear... Q	Getting-Rea... Q	01-02	30-40	Installation of Moodle
Moodle-Lear... Q	Getting-Rea... Q	02-03	0-10	Difficulty in steps: To check if XAMPP ...

As all the questions get sorted chronologically, it is easy to locate them on the basis of time. One can also see all different questions asked at a particular time. One can click on the title of a question to read the full question and the answers posted - a sample is provided in Fig. 5. One can join any of the discussions by asking more related questions. One can also answer questions that are previously asked. One can see that all the requirements of the previous section have been met:

1. As the method of posting is easily understood, and easy to follow, even a novice can post questions without making mistakes. As a result, one can say that this Timed QnA Forum is a friendly one that conveys to every user how to post the questions.
2. Next, the sorting method explained above can be used to easily locate the previously asked questions, and one does not have to be an expert to do this.
3. Finally, the above explained method of organizing the previous discussion helps produce useful content.

In addition to the above, additional help is provided to answer seekers, as we explain now. While posting questions on the Timed QnA Forum, as one begins typing the text of the Title of the question, we are prompted to view similar previously posted questions on Forum. Clicking on the previous questions link opens a pop-up box with the previous questions listed therein. Clicking on the hyperlinked questions, redirects us to another webpage where we can read the question and the associated answers. In most cases, these could satisfy the learner's query. If not, one can always go ahead and post the new question. This feature is useful and helpful in limiting the repetition of questions. The flow in using the Timed QnA Forum by a Spoken Tutorial user is illustrated in Fig. 4.

**FIGURE 4**  
**FLOW IN USING THE TIMED QNA FORUM**



### **TIMED QnA FORUM BENEFITS THE GENERAL AUDIENCE**

We already saw in the previous section that the three desired features of a forum are available in the Timed QnA Forum presented in this work. We will now present a few additional benefits.

With this Timed QnA Forum, it is possible to effectively and efficiently answer the questions of the participants of large workshops (Ganguly et al., 2016). Questions and answers happen silently, without disturbing others present in the workshop. Once a question is answered, this discussion becomes available to everyone. Participants of a large LaTeX workshop, who were forced to use the Timed QnA Forum, gave a positive feedback (Ganguly et al., 2016): They found the forum helpful, as they normally hesitated to ask questions in a large class, and as they usually missed details of discussion in a live class. They felt that their doubts were answered a lot faster than in a large class. They also felt that they did not have to wait to get their doubts cleared. Their answering pattern also indicated a high level of satisfaction.

The Timed QnA Forum discussed here also helps a lot in distributed settings. The authors' team has organized massive blended workshops for as many as 5,000 simultaneous participants, attending the workshop in 200+ locations (Moudgalya, 2019). If conventional methods are followed, one would need an expert at every location to clear the doubts. With the method adopted in the Timed QnA Forum, it is possible for a few experts to answer the doubts of several thousand participants. We should also point out that there will not be many duplicate questions, because of the way the forum is organized, as explained in the previous section.

During the COVID-19 pandemic, most workshops have participants from different locations. About 200 participants of a recently conducted DWSIM beginner level workshop (DWSIM-Team, 2021), from as many locations, found the Timed QnA Forum very effective. When asked to give their feedback about the forum approach, answers of the following type were obtained: questions were answered immediately, answers were cleared, it really helped in solving problems, most of the doubts were cleared in the forum itself, most of the common questions are already answered, and this platform is easily accessible to clear the doubts.

Finally, the Timed QnA Forum is helpful to address the changes due to versioning of software. It is possible that an open source software may be changing frequently, especially at initial stages of development. Unfortunately, Spoken Tutorials cannot keep pace with the software releases, as it takes a long time to create, because of the novice check requirement explained in Fig. 1. Whenever a feature changes in the software, one can immediately post it on the Timed QnA Forum at the appropriate location. In Fig. 5, one can see how the change in a software DWSIM is addressed.

**FIGURE 5**  
**ADDRESSING DIFFICULTIES DUE TO VERSION CHANGES THROUGH THE TIMED QNA FORUM**



## DISCUSSION AND CONCLUSIONS

The Timed QnA Forum presented in this work makes it easy for beginners to access previously happened discussions. It also makes it easy for them to ask new questions at appropriate locations. This forum also promotes peer-to-peer learning: even though the person answering a question may not be an expert, they may have sufficient expertise on the issue asked. If used constructively, the Timed QnA Forum can form a basis for creating FAQs. It is a type of on-the-fly documentation and with a little moderation by subject-matter-experts, has the capacity to help create useful content.

The forum provides networking opportunities, and access to expertise from a wide range of ages, backgrounds and geographies. It offers shy and more reticent learners the opportunity to participate in forum discussions more easily than in face-to-face sessions. When the learners take the lead role of answering a question posted on the forum, they themselves become independent learners.

One shortcoming of this approach is that this forum is tightly coupled with the underlying Spoken Tutorial, which itself may undergo version changes. We believe, however, that this problem can be tackled through a version-control type technology. There is also a difficulty in using the discussion in the Timed QnA Forum directly as additional content, given that most beneficiaries are beginners, and certain amount of curation time is required.

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