Using MediaWiki to increase teaching expertise in engineering colleges

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Abstract — **A scarcity in qualified and motivated teachers is a common problem in most Indian engineering colleges and specifically in the state of Andhra Pradesh where engineering colleges have increased exponentially in the last decade [1]. Additionally, a vast majority of the available teachers have no formal training in teaching unlike their counterparts in degree institutions and schools, ultimately affecting the quality of their teaching and thus the quality of the graduating students [2]. EnhanceEdu, has conceived the Art of Teaching workshop wherein MediaWiki was used as a platform for teachers to collaboratively work and design lesson plans incorporating Learner Styles, Bloom's taxonomy, Rubric design and Active teaching techniques. Over 200 teachers have been trained in the last one year through these workshops. MediaWiki not only helped teachers to integrate multimedia resources into lesson plans but also helped EnhanceEdu to remotely monitor post-workshop challenges and provide additional support.**

Keywords-MediaWiki; Bloom's taxonomy; lesson plans; teachers; teaching skills, Rubric design, Active teaching techniques;

I. INTRODUCTION

EnhanceEdu, the outreach division of IIIT Hyderabad, with the aim of enhancing the quality of education, conducted several training programs for teachers and students [3][4]. During the teacher training programs, it was observed that teaching methodologies used by the teachers were intuitive and self conceived and evolved by trial and error approach whereas the need for pedagogical training was even highlighted by the Ministry of Human Resource Development (MHRD) under the Technical Education Quality Improvement Program (TEQIP) – Phase II [5].

To enhance the teachers' pedagogical knowledge and teaching skills, EnhanceEdu designed and offered a hands-on "Art of Teaching" workshop. MediaWiki was used as a platform to work collaboratively on learning activities during the workshop and to evaluate participants' understanding through post-workshop challenges.

II. OUR APPROACH

Over 200 participants from VNR Vignana Jyothi Institute of Engineering and Technology (VNR VJIET) registered for the "Art of teaching" workshop. Participants were given a pre-survey before commencing the 3-day "Art of Teaching" workshop to understand the participants' knowledge on pedagogical aspects and MediaWiki. The content in the "Art of teaching" workshop was then customized and personalized for them by including relevant examples for the subjects that participants were teaching in their college. The workshop was completely hands on and activity based (refer Table 1).

Concept	Activity
Learning Styles [6]	Evaluate learning style
Blooms' Taxonomy [7]	Write objectives for each level of Bloom's Taxonomy
Lesson Plan Design	Design a lesson plan for a subject of their interest
Assessment and Rubric	Design assessment questions and rubrics for the questions
Active teaching techniques [8][9]	Create mind maps [10]
MediaWiki	Design a lesson plan in MediaWiki

Table 1: Art of Teaching Workshop

While building the learning activities, the participants were divided into department wise groups with different levels of experience within each group. MediaWiki served as a perfect platform for this collaborative work as it provided the group members with various levels of site access and control. The teachers added content synchronously after discussion within the team during the workshop.

After the workshop, another survey was conducted to capture the participants' opinion on how their skill-set had improved after the workshop, how the different modules were helpful to them and their students and their suggestions to improve the quality of the workshop. The Art of Teaching workshop also included challenges that were expected to be completed post workshop using MediaWiki.

Mediawiki proved to be an effective tool in many ways:

- Helped participants integrate multimedia content and other online resources such as OERS (Open Education Resources) into their lesson plans
- Provided a collaborative asynchronous learning environment where teachers could work on post workshop challenges in their free time.
- Supported in remotely monitoring post-workshop challenges and helped in providing support sessions

III. OBSERVATIONS AND RESULTS

For this paper, we have considered feedback from 204 participants. We ensured that participants filled pre and post workshop surveys designed to understand the prior and post knowledge of the participants in Learner Styles, Lesson Plan Design, Bloom's taxonomy, Assessment and Rubric design,

and Active Teaching Techniques. The post-workshop survey captured the participants' opinion on how their skill-set had improved with the workshop (refer Figure 1).
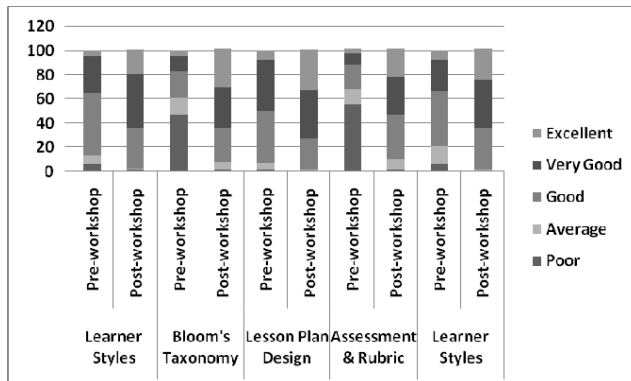

Figure 1: Teachers' feedback on Art of Teaching workshop sessions

In the post workshop challenges, participants were asked to work with their respective departments to create a template for lesson plan and work independently to create a lesson plan using that template. Figure 2 shows the lesson plan developed as part of post-workshop challenges.
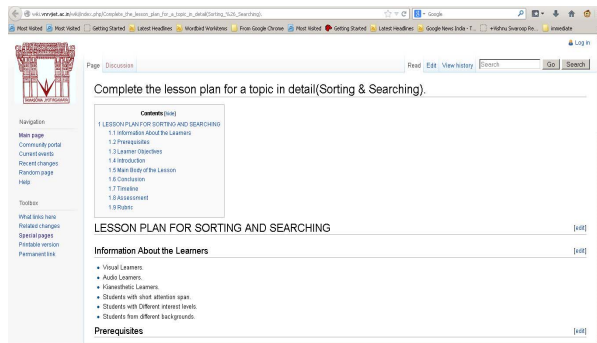

Figure 2: Sample lesson plan created by a teacher on MediaWiki

The lesson plans created by the teachers for the post-workshop challenges reflect a clear improvement in their knowledge in different pedagogical aspects (refer Table 2).

Prior to Workshop	Post Workshop
Course specific	Period and concept specific; outcome-based
Course wise learning objectives	Learning objectives addressing all levels of Bloom's Taxonomy; targeted to improve higher order thinking skills
Random assessment questions without rubrics	Assessment questions addressing Bloom's Taxonomy and have rubrics
Multimedia resources missing	Multimedia resources included
Content did not address learning styles	Content addressed learning styles

Table 2: Pre and Post workshop comparison of lesson plans

Since the entire post workshop challenges were updated in MediaWiki, we were able to remotely monitor and identify which departments needed help. We observed that participants from CSE and IT department completed all the post workshop challenges compared to the other departments. Based on this, we could plan post-workshop support sessions for the participants who needed more help.

IV. FUTURE WORK

We intend to measure the effectiveness of this workshop by collecting feedback from students and heads of departments. Using the data collected through MediaWiki, we propose to do learning analytics to gain deeper insight into the effectiveness of the workshop.

V. CONCLUSION

MediaWiki provided a collaborative platform to increase teaching expertise in engineering college faculty as they were able to integrate pedagogical concepts taught in the "Art of Teaching" workshop into their lesson plans. EnhanceEdu was able to monitor and help teachers remotely and through asynchronous learning among faculty in the wiki. Our observations indicate that teachers' skill levels improved significantly post "Art of Teaching" workshops.

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