
A skill sharing platform for team collaboration and knowledge exchange

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Abstract—A skill-sharing platform in our context refers to an online platform or a web page with an option to blog and transfer knowledge as well as skills. The web-page is going to host, as expected firstly, the blog, the comment section under it and an option to submit reports. The current platform to submit reports only has a submission option where the students upload the solutions to their tasks. So, in this project we set up a web page and engage people in meaningful learning activities as well as discourse. We shall also measure the effectiveness of such deployment in aiding and enhancing team work and collaboration of users using some available metrics and standard parameters. Collaboration, in the context of the type of interaction in the current project refers to the act of the users using blog for the fore-mentioned purpose of knowledge and skill transfer and working in unison. There have been many projects to evaluate the effectiveness of different components in blogging but very few to evaluate its effectiveness in our context. The paper takes us into detail about the components of the experimental setup and the methods of evaluation. The respective metrics shall be measured and evaluated in the results section.

Index Terms—Blog, Collaboration, Knowledge Transfer, Web page, Online Platform, Skill sharing, Knowledge Repository, Pedagogy.

I. INTRODUCTION

Right from the advent of blogging, it has been a very important medium of communication and a mode of expression between different people from varied professional and academic backgrounds in sharing knowledge, transferring information and updating skills. The main reason being that its easily accessible and almost cost free. Additionally, the interface is also very user-friendly. The people experiencing social anxiety are also at ease with this mode of communication as it eliminates the need for physical presence. This should be a great relief for people who are anxious about asking a question or actively participating in a class discussion. As blogging for cross domain knowledge and skill transfer involves individuals from various fields interacting on a professional level with certain deadlines, this mode of communication ensures stress-free completion of tasks with friction-less collaboration. Since it is also under the instructor's supervision the interaction

would be purposeful. The instructor will also be able to delete the comments that he deems to be inappropriate or unnecessary. He shall also have the access-rights to edit the blog. The comments under the blog shall be monitored by the instructor. He shall therefore supervise the interaction so as to ensure transfer of useful information. The introduction of blog section is expected to facilitate healthy exchange of ideas as well as constructive criticism. This is supposed to increase the cooperation between the students using the blog in accomplishing a particular task. In times of pandemics we are facing at the moment, this communication through such platforms is very appropriate and facilitates contact-less transfer of information. Hence, it would also be research worthy to observe and fully comprehend its potential in an academic scenario. More importantly, its role in collaboration and team work has been vital in many other environments and therefore this paper discusses how a skill sharing platform helps or aids in collaboration between its users thereby strengthening the team spirit. We have also incorporated our own method and integrated it into the current evaluation setup to make it more accurate.

In this paper, we intend to report our findings with reference to pedagogy in a technical environment with skill sharing over a knowledge repository among colleagues / a community with the same interests. The metrics of our evaluation would follow the criteria of DeLone and McLean Information System (IS) Success model.

The structure of the paper is as follows, to begin with, Section II gives a brief introduction to what we intend to do in our project environment and how we plan to implement it technically and the Related works are discussed in Section III. We also discuss the Proposed methods as stated in IV which we would be following. Eventually, in Section V we emphasize the problem statements we aim at answering, which exists with the current system of discourse. Through the Table I we intend to give a glimpse of our understandings and findings on the existing work in this field and emphasize later about how we intend to improvise our model through various

inferences. Accordingly, we proposed a method in Section VII that can help in tackling the problem mentioned in Section V. Thereupon, we exhibited the results against our metrics of evaluation against various pedagogical practices in Section IX before Concluding in Section X.

II. BACKGROUND

The development of blog had several stages with many features being developed and implemented across time. It was initially a web-log of entries used by professionals with a strict web-development background. This was because technical knowledge of Web Development and other related fields was required for the posting and maintenance of the whole web-log setup. Hence during this phase all that the blogs were comprised of was a log or a sequence of technical details of a project or a process. But after the introduction of interactive Web 2.0 websites the facility of maintaining a web based log of events or the steps of a process was extended to the common public who lacked any technical knowledge of creating or maintaining the website. This step in the spread of practice of blogging was nothing short of revolutionary. It was at this point in time that normal people started posting or blogging about their daily lives and updating their followers on the happening. Then came the feature on commenting and with that filtering as well as the censorship of the comments. However, the main increase in the practice of blogging could be attributed to the practice entering the realms of politics and sports.

There have been many contexts where meaningful research has been conducted on Blogging and various types of it. For Example, blogging could be very effective in business-related courses at a graduate or a post graduate level because the practices keep changing and are updated very quickly with time. The same applies for medicine as well as science and technology. Fields like arts, politics and philosophy could also benefit from the implementing blogging in their practices. Strictly sticking to an academic scenario it was also found out that the fields of arts, politics and philosophy could benefit from blogging by maintaining a log of the learning process at the least to adding new ground-breaking insights to the existing knowledge in the respective fields at its best. This paper concentrates on the knowledge sharing and skill transfer effectiveness facilitated by group blogging.

We have combined our knowledge and skill in web development technologies for the realization of our vision towards the implementation of the project environment setup. We have made use of technologies like PHP - for providing the dynamic contents to the scripts, JavaScript - for adding functionality to the blog, Hyper Text Markup Language (HTML) - for developing the front face of the web blog, Cascading Style Sheets (CSS) - for styling and personalizing the web blog and Databases - since the blog is data driven, the usage of a database for storing, accessing and retrieving data is done through the usage of SQL. In order to launch our designed blog, we have used Xampp server which acts as a local server assisting in hosting our website. We have elaborated the use of each of the aforementioned technologies and included

a glimpse into our work for better understanding in the upcoming sections.

III. RELATED WORK

Through our search, we have observed that there has been an extensive research and evaluation conducted in the fields of education, training, pedagogy and lifestyle with regards to the practice of blogging for knowledge colloquium.

This was done to identify the strengths of the usage of Blogging and to understand the merits and demerits of the approaches that were executed. Each approach devised with a different Engagement Analysis set up which was used for the evaluation of the extent of success the blog rendered.

To begin with, there has been immense work done in the field of pedagogy and training through blogs by [1] and [2]. The research and experimentation was set up to evaluate the effectiveness of the presence of a technical blog forum for training purposes. Also, the extent of impact it holds on the students was qualitatively measured against various factors for evaluation. It also held into account the performance improvement for the students as noted by the supervisors / teachers through the course of the blog usage. However, there was no measure of the relatedness to the topics with respect to the concept discussed which we intend to explore in our work. In the other projects different methodologies were used. Some of the most prominent ones were data depth analysis, survey, self-made reports, expert-observation, and analysis using Kolb's learning cycle. The projects which are relevant to this project as we have discussed have had diverse evaluation techniques and some evaluation methodologies are unreliable unless we clean the data like in the case of deep data analysis and surveys using sample sizes that were either too small. Also, when the test subjects or participants do not adhere to the rules of the survey being conducted, the results as well as the conclusions drawn from them would be faulty. In some projects the methodologies were so fault-proof that the disadvantages of such evaluation-setups very few. For example when we derive data of logins and logoffs as well as other activities and draw conclusions from the frequencies and incidences, we are supposed to leave out the outliers and consider only relevant data that might point towards any correlation. But in this system the main disadvantage the requirement of expertise in the field of Data Analytics as well as that which may be perceived as a breach of browsing privacy. Hence, a controlled and serious feedback from the participants would be the best form of arriving at results.

The project where the factors of transformative learning are impacted also produce meaningful research and conclusions as it is very important in today's world of change and innovation to be up-to-date.

The following table gives a summarizing of the literature review that was done for understanding the gravity and extent of work that was done towards the topic. Various methodologies were applied, which had their own merits and limitations, and also indication on the engagement of the user is analysed against each environment.

TABLE I: Literature Review on Existing approaches

AUTHORS	METHODOLOGY	MERITS	ENGAGEMENT ANALYSIS	LIMITATIONS	ENVIRONMENT
L. Giarre, et al [3]	Engagement based feedback system	User Stories based on three years of platform usage	Interviews and user stories	No measurable progress parameters	Blog
Wendy Freeman, et al [4]	Content evaluation, usage frequency and feedback	Good indicators - Prompt use and blog content evaluation	Survey, content evaluation, timelines/frequency of entries	Surveys - highly unreliable	Blog
Keith Turvey, et al [1]	Content Analysis, post usage feedback and perceived improvement Documentation	Content analysis - good indicator of coherence and resonance	Survey, interview and quality of entries	Susceptible to anxiety, awkwardness and shame	Blog
Gihan Osman, et al [5]	Critical reflection and Kolb's cycle markers and Questionnaire	Four pillars of Kolb's learning cycle - good indicators of the learning process	Content analysis for quality	Short time(6 weeks) analysis of blogging practices	Blog
Begoña Montero-Fleta, et.al [2]	Self reflection of content, comments and perceived improvement in skills	Descriptive and unique responses	Questionnaire, Interview	Only perceived improvement is recorded	Blog
Nianlong Luo, et.al [6]	Interpretation of organisational data by experts	Very scientific approach to testing hypotheses	Data of work times or login spans	No visible limitations except when employees are being dishonest	Blog(non-professional purpose)
Rafael Duque, et.al [7]	Data depth analysis	Very scientific - process uses data interpretation techniques	Data assembled from special features on Blog Site	Prone to errors when data is entered wrong	Blog with extra tools and features
Anupam Kumar Sharma, et.al [8]	Authors and readers traffic - Measurement of change	Good indicator of effectiveness of a Platform - User statistics	User statistics	Short term changes in user traffic - misinterpretations and lead to false conclusions	Reward based blogging platform
Ekaterina Arshavskaya [9]	Effectiveness judged upon the factors of transformative learning theory	Methodology well suited for a case study	External observer reviews blogs	Qualitative method - outcome completely dependent on the person reviewing	Blogs a journal
Hee-Woong Kim, et.al [10]	Survey	Huge populations - very reliable	Questionnaires answered by the users of a blogging platform	Surveys sometimes not taken seriously	Blog
Olivia Halic, et.al [11]	Student made reports	Good way of measuring perceived progress or learning	Reports made after careful reflection	Self made reports - easy to manipulate and not quantitatively measured	Blog
Inae Kang, et.al [12]	Journal and report based qualitative analysis	Keen observation of test subjects by experts involved	Student journals and observation by researchers	Can not be measured quantitatively	Blog
Yi-Shun Wang, et.al [13]	Performance reviews and ratings in solving or completing problems or tasks	Study is semi quantitative - effective	Feedback from clients and user stories	Almost no limitations	Blog
Jie ChiYang, et.al [14]	Tests and surveys	Quantitative measurement using linear regression	Linear regression model of performance vs. Time spent online	Survey results sometimes be skewed and inaccurate	Blog
Mei-hui Liu [15]	Test group and control group split and analysis	Splitting of groups makes the experimental setup effective in testing hypotheses	Interviews of participants	Interviews only reflect ones perceived willingness/improvement	Vlog
Ahmad Zamri Mansor [16]	Feedback based	First hand report of the experience via Feedback	Interviews and Questionnaires	Sometimes questionnaires can be annoying and lead to casual answers or replies	Blog as a learning journal

IV. PROPOSED METHODOLOGY

As stated previously, there exists a good amount of research and work which have provided substantial results with respect to the usage of blogs for team work and pedagogy. The key focus in our approach is to understand and evaluate the productivity of a team or person when a blog is used as a medium of knowledge exchange amongst a team. Also, we intend to evaluate the extent of preference a blog is given for communication when compared to the physical traditional methods. Through our work, we will be able to deduce if a blog is preferred over traditional methods when an intense collaboration is needed for a team to work over a knowledge repository.

In our approach, we have introduced the 'hashtag' which refers to mapping each topic to a certain domain. This determines the degree of relatedness of the post to the original topic. The quality of the blog content is thus maintained and monitored. Also, there is a possibility for the blog users to discuss and suggest or advise when necessary through the comments section. The communication done here amongst groups in the comment section, will serve as a key factor for increasing the net benefits for each group and users since it provides a stage for discussion and dialogue.

The website also introduces, for the users, a drafting option where he/she has the ability to create a new blog, which allows them to save it and make necessary changes later on. There also is an option for every user to be able to connect to the social media sites. For the admin, a very interactive, informative and intuitive dashboard is made available for the purpose of administration and management through statistical analysis available in their controls on the website. The admin also has the possibility of switching the website into maintenance mode very smoothly in the admin controls.

V. RESEARCH QUESTIONS

In this paper, we intend to address the following research questions as a part of our findings and address a probable future progress which can be made in the direction of better usage of an online platform for skill collaboration.

- 1) How much (if any) does reading or writing a blog improve the productivity and skill of a person or a team?
- 2) Are there any benefits of blog usage and sense of online classroom community arising from knowledge sharing in blogs compared to physical interaction with team members in traditional lecture scenarios?
- 3) Where intense collaborative work with team members is a requirement, is blogging a preferable option over physical interaction?

VI. MATERIALS AND METHODS

A. Participants

The participants in this experiment could come from varied educational and professional backgrounds. The participants are also qualified to varied extents in their own fields. There is no particular age group or gender or any ethnic background

that the participants belong to. The language of interaction is however English. The participants are required to use the blog page thoroughly with all the features available and fill a google forms questionnaire as feedback. The feedback form has a very small set of questions so as to accommodate for the critical thinking ability and the creativity of the user.

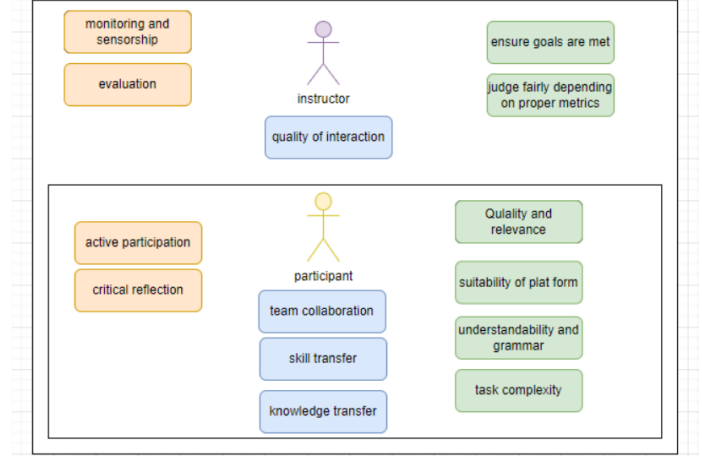


Fig. 1: Participants and Materials

B. Materials

The materials here refer to the interactions that the users have had while making use of the system. As indicated in the figure, each participant that belongs to a domain, has their dedicated set of interactions across the blog. Here in our case, we have given the Participant a limited set whereas the Instructor has additional privileges.

VII. IMPLEMENTATION

This section focuses on the Implementation of our blog.

A. Blog Building

The understanding and evaluations were deduced through our blog which has been designed to recognize and gauge towards the realization of our Research Questions. Initially a User Interface was developed, made interactive and then administration functionalities through Databases were added for the back-end support.

1) *Requirement Analysis and High-level Design:* The key step for any development is the analysis of the requirements for the project. Similarly, blog development for our universe of discourse needed prior analysis of the requirements. We have used the Unified Modelling Language to understand and gather the requirements of our system before proceeding further with development.

Below we present a brief overview of the requirement analysis performed by us for our website.

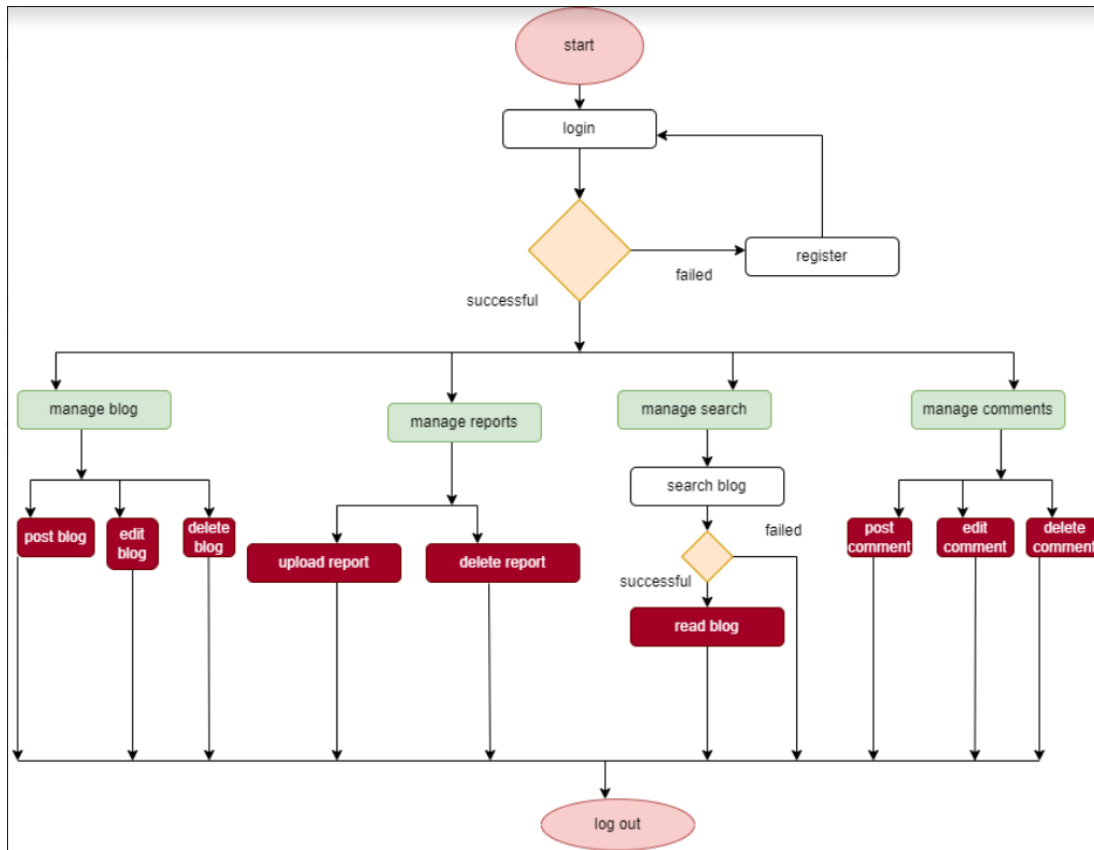


Fig. 2: Activity Diagram

a) *Use Case*: The use case diagram is used to deduce an environment and the use case for the project. For example, the use case for our model would be multiple Instructors who have the administrator rights over the blog to manage the accounts, blog contents, reports and also the comments posted over the blog. The Instructor also has access to statistics and dashboards of user information analysis.

The Blog user, in our case a student, would have access to the Blog content and the comments section, but would only be able to navigate through the contents of the website, add or edit blogs and comments.

b) *Activity Diagram*: In figure 2, we depict the diagram of Activity in our Website design. The flow of action and data through the Start module (Login) to Log out is depicted with the corresponding sub-activities.

The figure is a simplified version of our website's activity in general. Each user (admin or non-admin) has a similar course of action.

B. Implementation

1) *User Interface*: The User Interface plays a key role for interaction in any website since the look and feel is important to increase the appeal and usability. We have given a briefing about the development tools used for the User Interface implementation along with a piece of the sample codes for reference in the following:

- **User View page** - we have made use of the WordPress Admin Page as a reference for the user view or admin view of our blog. The structure and some ideas have been extracted and modified so as to suit our blog design.
- **PHP** - The website is developed in PHP in its entirety. Since it is a very powerful server-side scripting language, it generates very dynamic pages. The following listing is a brief overview of our PHP code for checking the User Statistics on the website for administrative purposes.

```

<?php include("db.php");
$sql="SELECT * FROM visitor_info ORDER BY id";
if ($result=mysqli_query($con,$sql)) {
    // Return the number of rows in result set
    $rowcount=mysqli_num_rows($result);
    printf("%d", $rowcount);
    // Free result set
    mysqli_free_result($result);
}
mysqli_close($con);
?>

```

Listing 1: PHP code for checking User Statistics

- CSS - to provide an ease of usage and access to each participant, we have styled our web pages with simple, yet intriguing formats. This was done using Cascading Style Sheets. The fonts, color schemes and the theme on the blog are made so that it is pleasant on the eyes. Since we have made extensive use of styling for personalizing our website, the CSS code is detailed and exhaustive. However, we have provided here, an excerpt from our code for the purpose of representation.

```
body {
    margin-top: 50px;
}
#wrapper {
    padding-left: 0;
}
#page-wrapper {
    width: 100%;
    padding: 5px 15px;
}
/* Side Nav */
.side-nav {
    margin-left: -225px;
    left: 225px;
    width: 225px;
    position: fixed;
    top: 50px;
    height: 100%;
    background-color: #222222;
    overflow-y: auto;
}
```

Listing 2: CSS Excerpt

- JavaScript - the functionality of each component on the web pages is written using JavaScript. Events and actions have been defined to determine what happens when a button or a certain icon is clicked upon. While implementing our blog, we have included the JavaScript code along with the PHP files. However, some exceptions were made so as to accommodate to re-usability of the JavaScript codes based on their frequency of usage. In the following listing, we represent a snippet from an event in our JavaScript code.

```
addEventListener("load", function() {
    setTimeout(hideURLbar, 0);
}, false);

function hideURLbar() {
    window.scrollTo(0, 1);
}
```

Listing 3: Excerpt of JavaScript Code

2) *Databases*: In order maintain an efficient and a persistent website, we have made use of the databases to store the data that is generated on our website.

We have used myphpadmin as the database. Since our website has various functionalities, we have used 14 Tables or Database Relations. Each of the 14 Relations comprises of a function on the website. The database is created using SQL language.

```
SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
SET AUTOCOMMIT = 0;
START TRANSACTION;
SET time_zone = "+00:00";

CREATE TABLE `editors_choice` (
  `id` int(10) UNSIGNED NOT NULL,
  `blog` int(10) UNSIGNED NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

INSERT INTO `editors_choice` (`id`,`blog`)
VALUES (2, 3), (1, 4);
```

Listing 4: Database View for our blog

C. Testing and Hosting

Any developed web application is bound to have errors, bad database connections or some issues at the time of hosting it online. This needs tremendous effort at being precise at the time of implementation. However, it is human to err. So, in order to avoid any erroneous circumstances at the launch of our website, and also since primarily a server-side scripting language (PHP) was used to develop the website, we have rigorously tested and hosted the developed blog site on a virtual server that has been installed locally - XAMPP. This was to ensure that the developed code was well tested before being made available.

Therefore, when no issues were observed when hosted on the XAMPP server, the website was made available online for the participants to use. This was followed by a feedback questionnaire whose results will be discussed shortly in the next sections of this paper.

VIII. RESULTS AND FEEDBACK

The results support that we have received substantial feedback that the blog is a good platform for facilitating knowledge exchange and skill transfer. The participants found the blog to also be helpful in a collaborative context.

The figures 3 and 4 depict the Usability Factors of the blog environment as per the participants' feedback. As shown in Figure 3, there is a huge percentage (almost 89 percent of the sample population) of the participants that agree that their attention span to the topics is considerably more than usual with a small margin agreeing

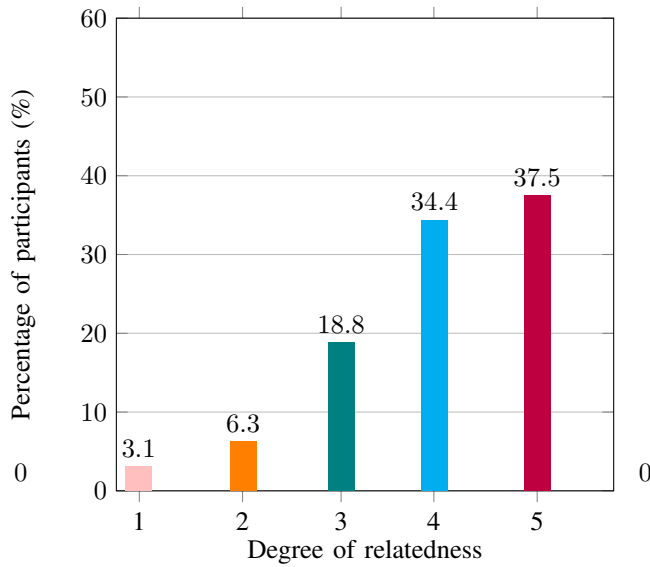


Fig. 3: Attention Span

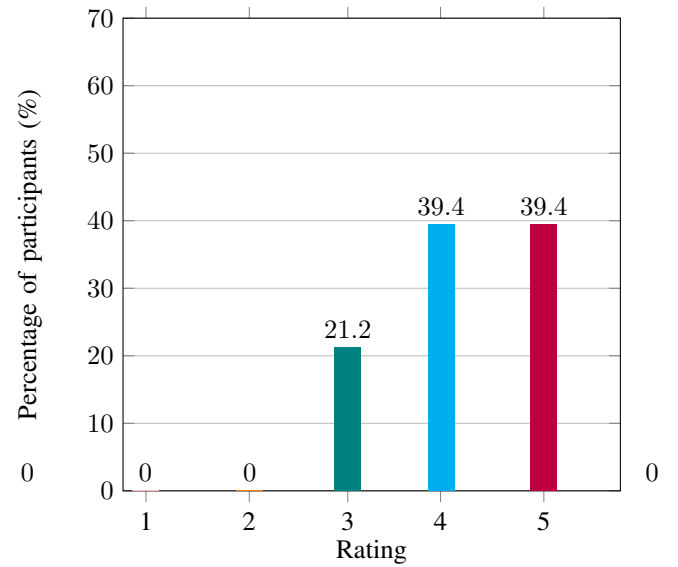


Fig. 4: Usability and Performance

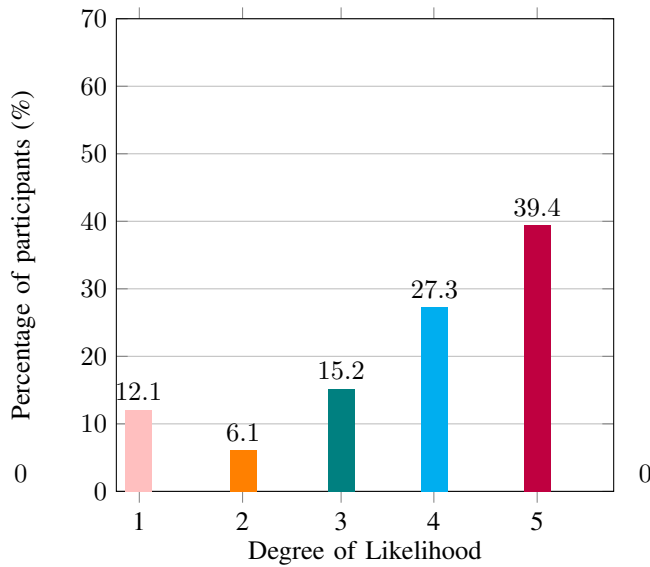


Fig. 5: Likeliness of posting comment

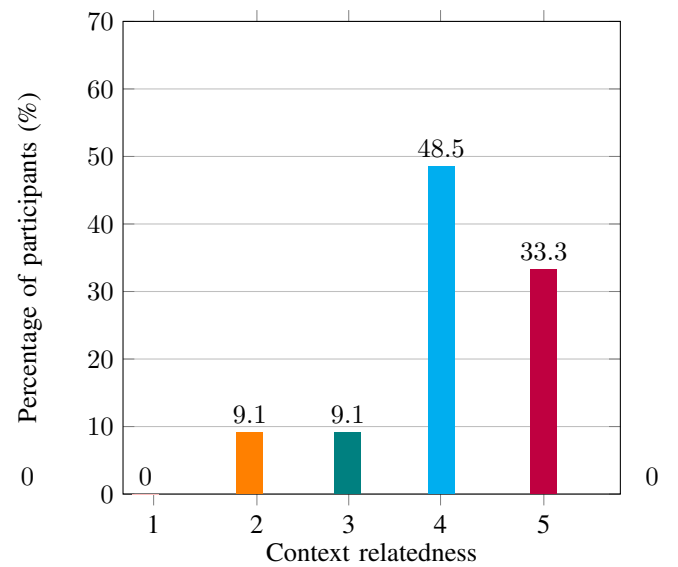


Fig. 6: Suitability of platform

otherwise. In Figure 4, all the participants rate that the performance of the system, personal performance and the system usability as a whole is best when in a blog environment. It is noteworthy that, when participants were asked about how likely they were to post comments over the blog to discuss topics and doubts, there were slightly mixed responses. Though a slight majority of the sample population (about 65 percent) agreed that the likelihood of them posting comments was high, a nearing equal amount of participants stated otherwise as depicted from Figure 5.

Also, considerably huge margin of the participants as depicted in Figure 6 agreed that the platform is very suitable for Team collaborations and Pedagogy in general. Some

commented further that they boost morale in the users for keeping up to date with the content made available for sharing amongst the community. The participants stated that they had a sense of community through an online platform for discussion, which is depicted through Figure 7. In the Figure 8, there is a strong agreement of nearly two thirds of the sample population feels like the blog environment is suitable for interaction over real world. When asked about the quality of content, more than 80 percent of the participants reported that the content posted was relevant and helped them overcome misconceptions and got their doubts clarified. The participants have also reported an increase in productivity. This was actually reported by over 85 percent of the participants.

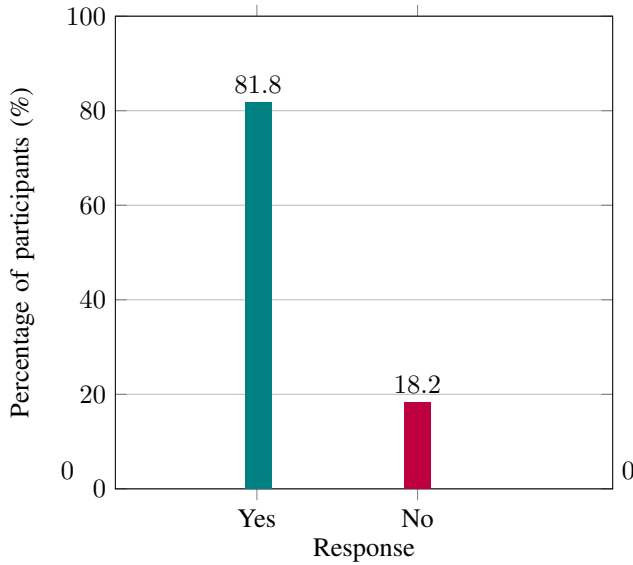


Fig. 7: Sense of community

To add on, a wide range of skills were reported to be acquired through the usage of blog. The most notable ones being Communication, Creative idea sharing, Group discussions, Team work, Reading and a deeper sense of understanding. The blog environment also offers a wide range of benefits like Overcoming anxiety, Networking and not being under the pressure to reply hastily.

The participants have also reported that regular blogging could have very strong positive impacts on different aspects of learning and communication in the university. The students could interact with each other more freely and communicate things better. It leads to better understanding of a particular course or a topic. The writing skills of the students are also bound to get better through frequency and time.

Further on, the blog could also be used as a journal where people can post on topics and have a record of their posts to refer to them afterwards. The blog could also be used by students to communicate with each other even after the lecture hours, according to a participant. More than 75 percent of the participants have reported that the system helps them express their ideas and emotions and communicate better. About 66 percent of the participants have reported that the blog has a potential to enhance team work. The participants have also reported that they are likely to come back to use the blog page after using it for the first time. This shows that the web page is very much suitable for most of the public using it. A little more than two thirds of the participants have reported that they would prefer to use the blog for technical knowledge. However, there are also users who would appreciate to have some content regarding Health, Entertainment and Current affairs.

On a final note, the participants' feedback has concluded our work with an affirmation that Blogs are an immacu-

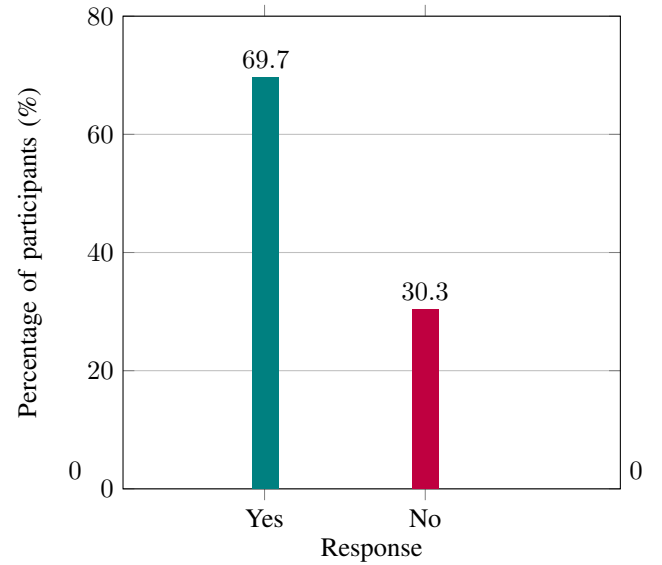


Fig. 8: Blog environment preferred over a real interaction

late source for Team collaboration. However, suggestions for additional features like lecture videos were also made so that the users could have a more deepened visual learning experience outside of the traditional classrooms.

IX. EVALUATION

In order to evaluate the performance of our environment of discourse, we have chosen the DeLone and McLean Information System success Model [17]. The model provides interrelated dimensions of success which is shortly discussed next. We have used these dimensions against the model designed by our team to evaluate the success. Since the DM model takes into consideration the factors like system quality, information quality, service quality, (intention to) use, user satisfaction, and net benefits; we have tried to satisfy all the factors to our best efforts and for the users best interests. Through our User surveys and feedback, we have concluded that our system:

- The blog page does increase the productivity of the person using it.
- The sense of a classroom community with common interests is felt as well as strengthened by the use of this blog.
- A blog environment would be preferred most of the time when collaboration between the users defines the nature of work or task.
- A wide range of skills could be acquired from the usage of blog.

X. SUMMARY AND FUTURE WORK

Our project aimed at encouraging participants towards the usage of a blog which has been designed by our team. Various aspects of our blog have been reviewed by participants and reported back to us through feedback forms which clearly answers our research questions and

indicates a very positive outcome.

The scope of such a blog could be to implement it in not just academic contexts on different levels but also in various other fields like work and recreation. As future work an improvement in the features could be suggested. A good example would be to develop a feature which also accommodates videos besides plain text. This way the content on the platform is very illustrative and also more lucrative to the users.

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