SELF- EVALUATION TOOLS FOR VARIOUS INDIAN LANGUAGES IN E-LEARNING USING WEB 3.0

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ABSTRACT

Over the past decades, e-learning has tremendously expanded as a global phenomenon. In compare, fewer attentions have been paid in India, in field of E-Learning, as we have a much diversified culture, especially languages. We have more than 30 major languages, having more than one million speakers, across the nation. The size of E-Learning market in India has tremendously increased over the past decades in a very impressive manner. Multi-Linguality is a major factor of Indian E-Learning market which degrades its performance& growth. Though we have E-learning for different languages but still it is not effective. There are a number of approaches used in E-Learning in India and self-evaluation, several of which have been discussed in this paper. E-Learning market in India can be increased by removing the language dependency, adding more functionality, implementing self-evaluation etc. This paper tool based on gather facts and figures and current technology to apply approaches to increase E-Learning market in India and implementing self-evaluation in a student's daily culture. In this paper, our contribution is to discover the available recognized comprehensive and an absolute model or frameworks for implementing self- evaluation for various Indian Languages, in E-Learning using Web 3.0

KEYWORDS: E-Learning, Self-Evaluation, E-Learning in India, Web 3.0, Semantic Web, Automatic Evaluation, Subjective Answers Evaluation

INTRODUCTION

Self-Evaluation is a process of analyzing and estimating, how much and what a student have learned so far. Assessment is done using several methods during; students learning process, through this scholar as well as guide both are able to make decision on future plan for studies. India has an enormous educational structure, having more than 200 university and more than 13000 colleges for higher education, but India is diversely unified as we speak more than 700 Languages. So implementing e-learning is a difficult task, also the socio-economic factor for every student is different, as they come from different background. Following are few initiatives that have been taken to implement e-learning in India.

- EDUSAT

- NetVarsity

- Teaching shoppe

- NTFITSD

- VCI

- EEDP

- PDF

- eC-eL

- OCPFS

- NPTEL

- Amrita VishwaVidyapeetham

- BITS Pilani

- Spoken Tutorial

As the e-learning market of India is very vast, many other approaches are also taken up. As an integrated part of e-learning, self-evaluation also plays a very important role. Through self-evaluation, a scholar can easily judge himself how much he/she understood, what is left, how to plan for future studies etc. Implementing self-evaluation for various Indian language is typical task, Learner vary in pre-knowledge, abilities, goals, pace, way, time, Money & the language used.

Further new approaches has been taken up across the globe to expand e-learning, by implementing learning culture through mobile devices

Chow Kok Kent, NaomieSalim, has proposed a model for Web Based Cross Language Plagiarism Detection, in this model they have used Google Translate API as a tool for cross language detection, using this tool we can also implement self-evaluation tool in e-learning using web 3.0. This paper presents the details on what the present scenario is, how to implement self- evaluation for Indian languages

WEB BASED E-LEARNING IN INDIA

India is the land of knowledge, we have been and still the main knowledge provider to the world, we have millions of young talent seeking knowledge to move ahead, Though we have the second largest infrastructure in the world, in terms of education system, we somewhere lack in providing the quality of education as we vary in terms of languages, background, thought process etc. To mind this gap our trend is also shifting towards e-learning, we have implemented many e-learning standards, and still in process to implement many other to cope up with the current scenario of the world. Concepts like ICOL, eLC, OTT, DSLOT, WBCMS, KMWBLE, SCROM, KMWBLE etc are in the process of being implemented. These model are changing the trend of our modern education system,

WORKING OF THE TOOL

Self-evaluation plays a important role in a scholars life, assessment is a process of obtaining, organizing and presenting information about what and how the student is learning. By implementing self-evaluation in a student's daily culture we focus on a more projected teaching approach, an object oriented point of study. There are some portals present online, providing self-evaluation, some examples are

- OLCS

- Khan Academy

- STACK

Basically self-evaluation is done by comparing what we know with what actual answer is. Both the knowledge, i.e. knowledge of student and the actual answer may vary. Answer for a particular question may be written differently in different book, it is also possible that the student may have chosen his own language this might may lead to variation in judgment. Student may be correct but not up to the mark. This technique is somewhat wrong for this a tool is being proposed in which a student can evaluate subjective answers, given in any language (Indian), the student do not have to confine oneself to a particular book or material. Prior to evaluation we need the following

- Question to be evaluated

- Answers of the respective question (Preferably in different language) up to 10

- Devices with internet connection for writing answers (Laptop, PC etc)

- Internet Connection

In the first step the Expert answers for the question will be taken, preferable there should be at least 5 answers and in different language, this will increase the generosity of the evaluation. After this the answer will be taken from the student. After taking the answer following steps will be done for evaluation

- The answer will be converted to English (if not) this will improve the comparisons efficiency

- With the help of semantic web we will again convert the result of previous step. Semantic web will closely infer the meaning behind the written text.

- Next step is to remove the stop words from the text obtained from the previous step

- After removing the stop word we will remove the suffixes to make answer more generalized and easy to compare

- Same process will be applied to all the expert answers

- Sometimes it is possible that different terms can be used for same thing for example rat is sometimes referred as mice, vermin etc. to remove the synonym problem we will use synonyms.java, an API that index all the synonyms together

- Now we will create a term frequency matrix out of the terms obtained from different answer and their occurrence in that particular answer.

- After calculating Tf (Term frequency) we will calculate idf (Inverse document frequency). Idf basically calculate how a term is important to all the documents. It might be possible that a term repeated several times in an answer is the least important word. For example stop words like "the", "an" etc.

- Now we will calculate a matrix with two columns first column contain lesser terms which are important for that answer, and second column that contains the terms of the answer to be evaluated

- Now we will compare the answer column with most appropriate expert answer column with the help of cosine

similarity. The result obtained will be the score acquired.

EXPERIMENT

Before starting we need following. Question to be evaluated, Corresponding answers

Q. What is computer?

Now we get some expert answers (in different language)

A1.Computer is electronic device which takes input manipulates it and produces output

A2. કમ્પ્યુટરવપરાશકર્તાઓસૂચનામુજબકામકરેછે (Gujrati)

A3. নির্দেশাবলীউপরআচরণকারীএকটিবৈদ্যুতিকডিভাইসদ্বারাস্বয়ংক্রিয়ভাবেকম্পিউটার (Bengali)

A4. सूचनावरकार्यकरतोविद्युतसाधनआपोआपसंगणक (Marathi)

And let the answer to be evaluated be given in Hindi

Answer. कंप्यूटरएकबिजलीद्वारास्वचालितउपकरणहैजोनिर्देशोंपरकामकरतीहै (Hindi)

FIRST STEP

Now the first step is to translate all the answers in English. This step will be done with the help of Google translate API

A1- Computer is electronic device which takes input manipulates it and produces output

A2- Computer users as instructed Works (Gujrati)

A3- Automatically by an electrical device which acts on the instructions of the computer (Bengali)

A4- Power tool automatically works on computer information (Marathi)

Answer - The computer automatically by an electrical device which acts on instructions

Now we see that the answer received after translation is not in proper grammar. Now here comes the role of semantic web.

SECOND STEP

The second step is semantic web translation. In this step we will closely infer the meaning behind every expert answer and the answer to be evaluated. After this step we will get the following result

A1- Computer is electronic device which takes input manipulates it and produces output

A2- Computer works on user instruction (Gujrati)

A3- Computer is an electronic device which acts automatically on user instruction (Bengali)

A4- Computer automatically works on instruction(Marathi)

Answer - The computer is an electronic device which automatically works on instructions

THIRD STEP

In the third step we will remove stop words and suffix and prefix problem. We will get the following result

A1- Computer electronic device input/instruction manipulate produce output

A2- Computer work/Manipulate user instruction (Gujrati)

A3- Computer electronic device act automatic user instruction (Bengali)

A4- Computer automatic work instruction (Marathi)

Answer - computer electronic device automatic work instruction

FOURTH STEP

Now we will create term frequency matrix, this step also include the use of synonyms API java in order to remove synonyms problem

TERMS	A1	A2	A3	A4	ANSWER
Computer	1	1	1	1	1
Electronic	1		1		1
Device	1		1		1
Input/instruction	1	1	1	1	1
Manipulate/work/act	1	1	1	1	1
Produce	1				
Output	1				
User		1	1		
automatic			1	1	1

FIFTH STEP

Now we will compare the answer column with the most matching column. In this case answer A1 matches the most to Answer. No we will calculate the cosine similarity between them

TERMS	A1	ANSWER
Computer	1	1
Electronic	1	1
Device	1	1
Input/instruction	1	1
Manipulate/work/act	1	1
Produce	1	
output	1	
user		
automatic		1

Vectors are

A1: [1, 1, 1, 1, 1, 1, 1, 0, 0]

Answer: [1, 1, 1, 1, 1, 0, 0, 0, 1]

$$\cos(\underset{A1}{\rightarrow}, \overrightarrow{ANSWER})$$

$$= \frac{1.1 + 1.1 + 1.1 + 1.1 + 1.1 + 1.0 + 1.0 + 0.0 + 0.1}{\sqrt{1^2 + 1^2 + 1^2 + 1^2 + 1^2 + 1^2 + 1^2 + 0^2 + 0^2}.\sqrt{1^2 + 1^2 + 1^2 + 1^2 + 1^2 + 0 + 0^2 + 0^2 + 1^2}}$$

$$\cos(\underset{A1}{\rightarrow}, \overrightarrow{ANSWER}) \approx 77.15\%$$

SIXTH STEP

No we got the percentage similarity, now we have to convert it into grades we will simply calculate the percentage of the max marks of the question for example, let the question be of

2 marks:- 77.15 % of 2 = 1.543 ≈ 2 (Marks Obtained)

3 marks:- 77.15 % of 3 = 2.3145 ≈ 3 (Marks Obtained)

5 marks:- 77.15 % of 5 = 3.8575 ≈ 4 (Marks Obtained)

10 marks:- 77.15 % of 10 = 7.715 ≈ 8 (Marks Obtained)

CONCLUSIONS

A self-evaluation tool can be developed that can be developed having following benefits

- Can help students in self-evaluation

- Can help student studying in different language

- Reduces the professors load

- Provides a common platform avoiding any discrepancies

- Promote e learning as more powerful tool

- Remove the language barrier

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