“Educational Data Mining” Case Study - Bangalore

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Abstract: Educational Data Mining (EDM) describes a research field concerned with the application of data mining, machine learning and statistics to information generated from educational settings (e.g., universities and intelligent tutoring systems). At a high level, the field seeks to develop and improve methods for exploring this data, which often has multiple levels of meaningful hierarchy, in order to discover new insights about how people learn in the context of such settings. In doing so, EDM has contributed to theories of learning investigated by researchers in educational psychology and the learning sciences. The field is closely tied to that of learning analytics, and the two have been compared and contrasted. In This Paper we have conducted a Questionnaire Survey on 500 Software Engineers to understand the present scenario of EDM.

Keywords: EDM, strategies & Questionnaire.

INTRODUCTION

Educational Data Mining refers to techniques, tools, and research designed for automatically extracting meaning from large repositories of data generated by or related to people's learning activities in educational settings. Quite often, this data is extensive, fine-grained, and precise. For example, several learning management systems (LMSs) track information such as when each student accessed each learning object, how many times they accessed it, and how many minutes the learning object was displayed on the user's computer screen. As another example, Intelligent tutoring systems record data every time a learner submits a solution to a problem; they may collect the time of the submission, whether or not the solution matches the expected solution, the amount of time that has passed since the last submission, the order in which solution components were entered into the interface, etc. The precision of this data is such that even a fairly short session with a computer-based learning environment (e.g., 30 minutes) may produce a large amount of process data for analysis.

In other cases, the data is less fine-grained. For example, a student's university transcript may contain a temporally ordered list of courses taken by the student, the grade that the student earned in each course, and when the student selected or changed his or her academic major. EDM leverages both types of data to discover meaningful information about different types of learners and how they learn, the structure of domain knowledge, and the effect of instructional strategies embedded within various learning environments. These analyses provide new information that would be difficult to discern by looking at the raw data. For example, analyzing data from an LMS may reveal a relationship between the learning objects that a student accessed during the course and their final course grade. Similarly, analyzing student transcript data may reveal a relationship between a student's grade in a particular course and their decision to change their academic major. Such information provides insight into the design of learning environments, which allows students, teachers, school administrators, and educational policy makers to make informed decisions about how to interact with, provide, and manage educational resources.

RESULTS & ANALYSIS

The existing expertise and computer facilities at the University can facilitate to develop a data warehouse.

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>293</td>
</tr>
<tr>
<td>Agree</td>
<td>136</td>
</tr>
<tr>
<td>Disagree</td>
<td>55</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>16</td>
</tr>
</tbody>
</table>

The existing expertise and computer facilities at the University can facilitate to develop a data warehouse.
88% of the population agree that the existing expertise and computer facilities at the University can facilitate to develop a data warehouse. But 14% of the population disagrees to it.

**The resulting Data warehouse Model could be tested in a real case in order to evaluate its completeness.**

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>286</td>
<td>123</td>
<td>65</td>
<td>26</td>
</tr>
</tbody>
</table>

The resulting Data warehouse Model could be tested in a real case in order to evaluate its completeness. 82% of the population agree that the cost of building a data warehouse is expensive for any educational institution as it requires data warehouse tools for building data warehouse and extracting data using data mining from data warehouse. 18% disagree to it.

**Developing a data warehouse for educational institute is the less focused area as educational institute are non profit and service oriented organizations.**

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>306</td>
<td>128</td>
<td>48</td>
<td>18</td>
</tr>
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</table>

87% of the population agree that developing a data warehouse for educational institute is the less focused area as educational institute are non profit and service oriented organizations and 13% disagree to it.

**Educational data mining and learning analytics are used to research and build models in several areas that can influence online learning system.**
81% of the population agree that educational data mining and learning analytics are used to research and build models in several areas that can influence online learning system whereas 19% of the population disagree to it.

Technical challenges are that educational data systems are not interoperable. So bring together administrative data and classroom level data remains a challenge.

88% of the population agrees that Technical challenges are that educational data system is not interoperable. So bring together administrative data and classroom level data remains a challenge where as 12% of the population disagrees to it.

What are the benefits of educational data mining and learning analytics? What factors have enabled these new approaches to be adopted? These are important queries to be solved

84% of the population agrees that what are the benefits of educational data mining and learning analytics? What factors have enabled these new approaches to be adopted? These are important queries to be solved whereas 16% of the population disagrees to it.

What are the broad application areas for which educational data mining and learning analytics are used? These are important queries to be solved
84% of the population agrees that what are the broad application areas for which educational data mining and learning analytics are used are important queries to be solved where as 16% of the population disagrees to it.

REFERENCES


