Learning Analytics and an Evaluation Specific to University Libraries

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Research Article

ARTICLE INFORMATION

ABSTRACT

Learning analytics aims to evaluate the data obtained from learning environments with various methods and to improve the learner experience on educational platforms. Thus, educational institutions will be able to develop their strategies and policies regarding the improvement and development of the learning process. In addition, it will help strengthen learner-oriented systems too. In practice, learning analytics especially based on the analysis of data on learning management systems. However, ignoring the data sets on the systems used by education and training complementary units such as libraries causes the results of the implementation to be questioned. The framework and library-specific evaluation of learning analytics applications performed in universities was discussed in this study. In addition, it was aimed to determine the place of libraries in learning analytics. The documentary research method was used in this study. Studies on learning analytics and educational data mining have been identified by this method and library-learning analytics relationship has been evaluated. According to the research results, university libraries have many data sets of their users on their websites, electronic systems and social media tools. One-way learning analytics applications that these data sets are not included will lead to deficiencies in planning the future. In addition, libraries should consider ethical issues related to learning analytics, such as user privacy, data privacy and security.

Keywords: Learning analytics, University library, Educational data mining.

I. Introduction

Especially in the last thirty years, people can communicate and share information on the web continuously and simultaneously because of excessive growth of information and communication technologies. This situation leads to the emergence of a large amount of usable / unusable data on the web in raw form. Factors such as data being in an irregular and scattered form, on different platforms and in different formats makes this large amount of data very difficult to organize and analyze. However, technological developments have also pioneered the emergence of various tools and methods for obtaining, analizing and presenting this data. These new techniques, which allow especially commercial organiations to make service and production planning by examining customer behavior, play an important role in shaping the strategies and policies of the enterprises.

Education is one of the areas most affected by technology. Analysis of incremental teacher and learner experiences provides unique data for planning education.

Learning analytics, which emerged with the aim of improving learning processes and enviroments, is based on obtaining data from learning enviroments using these techniques and analyzing this large amount of data. The presentation of these analyzed data will enable both institutions and students to take precautions against predicted problems that they may experience in the future. In addition, it will allow data-based decisions to be made in order to use economic and pedagogical resources in the most convenient way (Alkan, 2017).

Today's education system where independent and lifelong learning is aimed personalized training platforms and learner focused systems are at the forefront. The use of larning analytics to reveal learning experiences in their development is encouraged. Siemens (2011) defines learning analytics as a method that express the measurement, analysis and sharing of outputs by collecting the data emerging in the enviroment and processes in which learning takes places. The goal of learning analytics is to improve the learning enviroment and process by evaluating the findings.

As with the entire educational community, universities

have a wealth of data on educational activities too. Especially during pandemic process, that most universities switch to distance education lead to produce too much data to be analyzed on behalf of being improved the latter process. Learning analytics practices will enable that these data discovering are through analyzed and reported improvement and policy making based on learning experiences of individuals.

Learning analytics is a new field of study for the e-learning field. Purpose is that the experiences of e learning stakeholders analyzing are used in solve the problems and planning. Although the ethical debates in literature about learning analytics continue, it is possible to list like that the learning analytics' advantages on stakeholders:

Instructors: They help to been detected the current situation by monitoring learner performance and to plan teaching activities.

Learners (Students): According to their peers, helps to increase in learning efficiency, can achieve their goals and increase their motivations.

Managers: Contributes to the effective using of resources, to stand out in global competition and to increasing the quality of the learning process (Akçapınar, 2021; Çiloğlugil, 2017, p.135)

In analyzing stakeholder experiences, it is important to evaluate all the elements that interact. Analysis of the experiences with libraries which are the effective elements of university education is valuable in the context of the construction of an independent and continuous learning-aimed teaching environment. Evaluation of learning analytics that are subject to this study for university libraries, It will enable library administrators and decision makers on the library to benefit from learning analytics techniques and methods to plan work and operations. Thus, in order to make the learning processes of students more qualified both in the library and in university, it is predicted that been created awareness for necessary studies.

University libraries, which are an indispensable part of education and learning, have a wealth of data on the information acquisition and learning behavior of their users. Altay (2019, p. 287), with mining techniques, express that analyzing the data emerged as a result of transactions on library information systems will guide library services and policies. Processing by acquiering these data, which are waiting to be discovered on information access and automation systems will enable to analyz the learning behavior of researchers and students who benefit from frequently university libraries. At the same time it will open up an opportunity for libraries to see their missing or problematic sides and to fix their errors. In this context, aim of the study is to determine what kind of results can be achieved by analyzing data in information systems used in university libraries using learning analytics techniques and methods. In this way, libraries will be able to perform the requested and required jobs and transactions by planning their service and resource management in this direction. In addition, learners (student, researcher, etc.) will be able to have a more efficient learning experience by using personalized learning activities, thanks to suitable applications for their own learning style. For this purpose, research questions

can be list as follows:

What kind of relationship between the university library and learning analytics are available?

What kind of research can be done on university libraries with educational data mining techniques?

What is the supporting role of libraries in learning analytics processes implemented at universities?

What are the attitudes of university libraries towards learning analytics?

Documentary scanning and description methods will be used in order to evaluate the learning analytics applications that are the subject of this study in the context of university libraries.

Before learning analytics are evaluated specific to university libraries, it would be beneficial to mention the concepts, applications, business process, method and techniques related to this field in order to understand the subject clearly.

II.   Learning Analytics

It is known every action taken on electronic systems leaves mark. These tracks express the record of all data from users'logging in and out to the actions they perform on them. Given there are traces of learners, trainers, system administrators and senior managers on electronic learning systems, it is possible to talk about a large amount of data waiting to be discovered and analyzed on system in order to improve the learning envirements.

Learning analytics started to develop with the adaptation of data analytical methods, which emerged as a product of developments in information technologies in the early 2000s, to learning environments and processes. In particular, parallel to the frequent use of e-learning platforms, it aims to measure and improve the quality of education as a result of revealing and analyzing data. The origins of learning analytics are based on business analytics, which depends on the desire of determining customer trends by analyzing data, on the web, of enterprises that have commercial aim. These applications, which aim to improve the products and services of the enterprises paralelly increase the profit rates with the analysis of unique datasets which emerge, have been adapted to different disciplines over time (Bozkurt, 2016). Learning analytics, which is designed to increase the quality of learning process and to determine the learner performance, is defined as a field that covers the processes that large amounts educational datasets are processed, reported and attained from the servers information systems operate on, as well as displayed in order to improve supportive individual learning envirements for the learner (Fırat, 2015). In this way, it will been enabled that trainers, e-learning systems designers and policy developers evaluate the education envirement and make prediction about possible situations. Restructured strategies, policies, systems and practices will be able to contribute to orient process and improve educational elements.

All these learning analytics jobs and processes take place with many techniques and tools currently in use. Çiloglugil (2017); says that learning analytics is a field

that emerges by benefiting from data mining, machine learning, artificial intelligence and statistics applications. However Dyckhoff (et al. 2012, p. 58) expresses learning analytics as a field that emerges and developes as a result of that techniques are gathered used in different fields such as educational data mining, social network analysis and academic analytics. Therefore, it can be said that the further development of this new field over time depends on the development and diversification of pratices, tools and methods in different disciplines. Additionally, it is useful to refer to the origin of learning analytics, which is affected by many areas, techniques and methods, and to look at the events that it is affected by in the process.
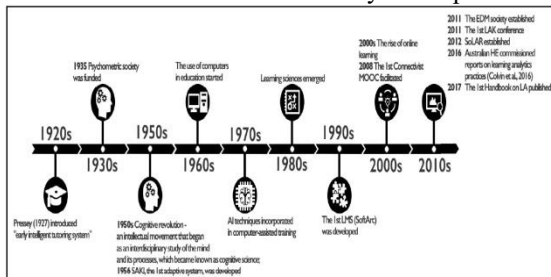

Fig. 1. Development of learning analytics (Source: Joksimovic and Kovanovic, 2019, p. 42).

In Figure 1, it is clearly seen that the development of learning analytics is shaped depending on education, psychometry and technological developments. Accordingly, the factors on the emergence and development of learning analytics as a field can be listed as follows:

- The emergence of intelligent learning systems and the development of computer-aided applications,
- Funding the psychometric community and developing mathematical models for the explanation and interpretation of human behavior with the adaptation of statistical methods to psychology ("Psikometri", 2020).
- The realization of the Cognitive Revolution based on the idea of interdisciplinary examination of the mind and its processes,
- The widespread use of computers in education and the transition to computer-aided education,
- The emergence of the science of learning,
- Development of learning management systems,
- The spread of online learning,
- Establishing the Educational Data Mining Society, organizing meetings on educational data mining and conducting scientific studies,
- Learning analytics studies started,
- Establishment of SoLar (Society for Learning Analytics Research),
- The publication of a learning analytics handbook, journal and other scientific studies on the subject.

Given above expressions that are listed about improvement of learning analytics and stages in figure 1, that education and many related fields have pave the way for the emergence of learning analytics is seen. However, considering that learning analytics are dependent on both technological infrastructure and techniques and methods in different disciplines, it can be predicted that they may

reach different dimensions in time in parallel with the technological developments and diversifying new techniques in the future. In this case, it is predicted that learning analytics methods and techniques will diversify and more intelligent learning platforms will emerge by taking advantage of the developments in different fields and branches of science.

Over the years, scientists have been researching on learning and teaching, tracking students' progress and improvement, analyzing data obtained from schools or universities, and applying various methods to enhance teaching-learning processes. Using this application as base, learning analytics analyzes using data that attained from learning activities in electronic enviroments, data science instruments and artificial intelligence tools (SoLAR, 2021) In this direction, the learning analytics process can be expressed as folllows at the basic level.
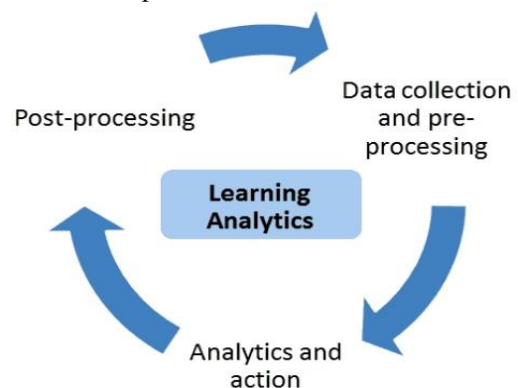

Fig. 2. Learning analytics process (Source: Chatti, Dyckhof, Schroeder, Thüs, 2012).

Figure 2 shows that the learning analytics business process consists of 3 main processes.

- Data collection and preprocessing process: For the purpose of collecting educational data it express the process of obtaining data and revealing useful data. These data can be easily accessible in an orderly fashion, depending on the design of learning enviroment but they can be in an irregular or scattered too. In such cases, these data should be made available by subjecting to preprocessing with educational data mining techniques. In this process, it is appealed to data cleaning, data integration, data transformation, data reduction, data modelling, user and session identification and path completion techniques.
- Analyzes and actions: It is a process that covers that data is demonstrated by analyzing and reading obtained reports are used for actions such as monitoring, analysis, prediction, intervention, assessment, adaptation, personalization, recommendation, and reflection.
- Post-process: It express the process in which feedbacks and improvements are made according to the success of the taken place implementation. This step includes the processes of compiling new data from additional data sources, refining the dataset, defining new indicators and criteira, changing analysis variables or selecting a new analytical

method (Bahçeci, 2015, p. 44-45; Chatti, Dyckhof, Schroeder, Thüs, 2012).

In addition to displaying the learning analytics simply, it is also necessary to examine the micro transactions in the process. Thus, the work flow in the process will be understood more clearly. Siemens describes a comprehensive work flow related to learning analytics as follows:
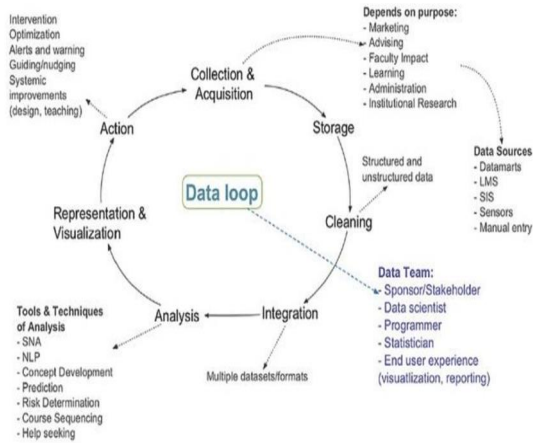

Fig. 3. Learning analytics workflow model (Source: Siemens, 2013, p. 1392).

As seen in the figure, this model developed by Siemens consists of 7 components.

Collection & Acquisition: Revealing the data to be analyzed.

Storage: Storage of the obtained data.

Cleaning: Removal of abnormal and inconsistent data.

Integration: Adaptation of data to existing data sets or a common vocabulary.

Analyzes: Analyzing the data so that they can be explained and predicted for the future.

Presentation & Visualization: Creating reports and diagrams in order to show the results.

Alerting: Real-time implementation of models to alert relevant stakeholders (Classroom Aid, 2014; Siemens, 2013).

Kop, Fournier and Durand (2017, p. 320) say that learning analytics is closely related to educational data mining. Because, it is possible to discover patterns that belongs to datasets on e-learning systems by using educational data mining methods and techniques. By using these techniques and various analysis methods, understanding of data, determining patterns, revealing trends, forecasting and early intervention practices and development of suggestion systems can be achieved. Learning analytics, on the other hand, includes the applications of using the discovered data sets and patterns in improving, developing and teaching design related to the learning process (Keskin, Aydın and Yurdugül, 2019, p. 295). Therefore, that it is necessary to address the issue of educational data mining, which has a strong connection with learning analytics is obvious.

III. Educational Data Mining

In the Dictionaries of the Turkish Language Society (Türk Dil Kurumu, 2019) data is defined as convenient

formed demonstration of fact, concept or commands for communication, interpretation and operation. In definition, the display of the data in a usable form comes to the forefront. This situation brings to mind that data mining techniques are implemented. The data mining can be described as a set of applications that include all of the tools, techniques and methods developed fort he purpose of analyzing large amounts of data. Hand (et al., 2000, p. 111) mentions that data mining is a discipline which develops in relation to many disciplines along with the emergence of big databases. Hand, Manila and Smyth indicate that the purpose of data mining is that large datasets are analyzed by using new methods to summarize the data which is thought to be understandable and beneficial and to determine the relationships between the data (as cited in Aydın ve Özkul, 2015, p. 37). In some sources, it is stated that data mining is regarded as an important part of information discovery process and joins in this process.
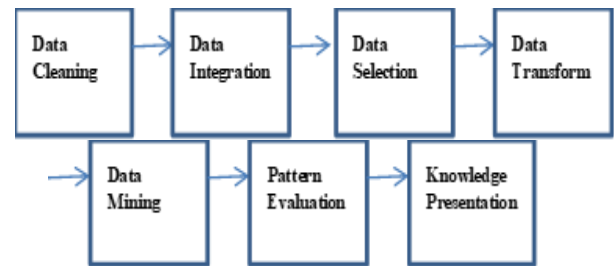

Fig. 4. Information discovery process (Source: Han, Kamber & Pei, 2011, p. 6-8).

In figure 4, the process from clearing the data obtained in the information discovery process to the emergence and presentation of meaningful information is expressed. The figure explains that some preliminary process need to be performed on the data as the data mining application is carried out. Afterwards, information can be displayed thanks to data mining applications. At the same time, data mining application, which is an important element of information discovery, has a process in itself. Wirth and Hipp express this process as follows.
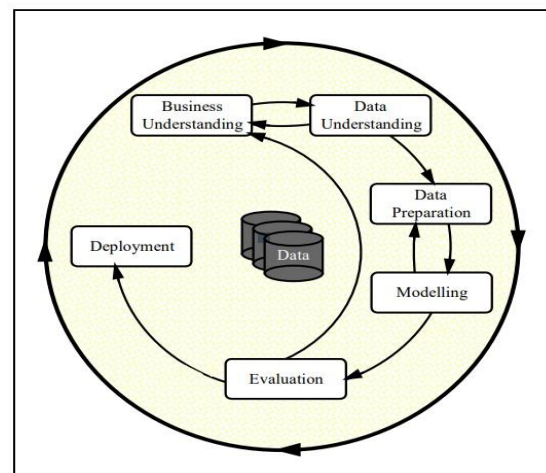

Fig. 5. Data Mining Process (Source: Wirth, R., Hipp, J. 2000, p. 5).

Business understanding: At this stage, the actions of understanding and planning in order to obtain the targeted and required information are carried out.

Data understanding: At this stage, the suitability, usefulness and quality of the collected data are determined.

Data preparation: This stage includes the process of revealing the final data sets by processing the raw data determined to be fit for purpose. The process includes table, record and feature selection, data cleaning, creating new attributes and transforming data for modeling tools.

Modelling: This stage covers the selection and application of various modeling techniques.

Evaluation: This stage includes the process of evaluating the models created for data analysis in a more comprehensive way and understanding whether they are designed in accordance with business goals. After this stage, a decision is made regarding the use of the results obtained by data mining application.

Deployment: The final stage of data mining implementation is not the creation of the model. This step covers the process of organizing and presenting the information obtained so that it can be understood and used by users.

Vahaplar and İnceoğlu (n.d.) mentioned that the data mining discipline brought new applications and listed them as follows:

- Business and electronic commerce data: Data that emerges organically in business processes within institutions and organizations and can be used effectively in decision-making.
- Scientific, engineering and healthcare data: It deals with applications on data that can be used and analyzed in the field today, when scientific data is becoming more complex than data emerging in the business world.
- Web data: It includes digital data as well as text, images, videos and other formats on the web.

It is possible to add datasets which will be able to derive from education enviroments into data mining applications, which is a interdisciplinary workspace. Therefore, educational data mining applications are not much different from traditional data mining applications. Data on educational enviroments (especially e learning enviroments) consist of the scope of educational data mining. Hirata and Cansu (n.d.) state that data mining in the field of education is entitled as educational data mining in the literature.

Öztürk (2018) mentions that systems where learning processes and navigation behaviors can be followed through digital tracks that belong to learners on open and distance learning enviroments are widely used. Educational data mining is a discipline that aims to develop methods to detect unique data types in educational enviroments and to make learners and learning enviroments more understandable through these methods. It benefits from different fields such as psychometry, machine learning, artificial intelligence, learning analytics, psychology and statistics to achieve this goal (Türel and Engin, 2016, p. 56).

Akgün and Bulut Özek (2020, p. 201) describe the usage purposes of educational data mining as follows:

TABLE I
USAGE PURPOSES OF EDUCATIONAL DATA MINING

Provide information to educators	Analysis and visualization of data Giving feedback to support educators
Provide information to students	Suggestions for students
Determining student characteristics	Determining student performance Student modeling Detecting unwanted student behavior Grouping students
To reveal the relationships between students and concepts	Social network analysis Concept map development
Help with planning and creating lessons	Setting up educational software Planning and scheduling

It is clearly seen in Table 1 that the usage purposes of educational data mining are shaped within the framework of educators, students, concepts and lesson planning.

In brief, the purpose of applying educational data mining and learning analytics can be refers to as that e learning enviroments are improved; training strategies, policies and programs are developed; learner-oriented individual learning systems are designed; educational evaluations are carried out for educators and decision makers. For this purpose, it can be possible to carry out a smooth and complete process with an integrated systems in which all elements and units belonging to the educational enviroment are together. So, excluding libraries with many data sets on learners in universities will cause erroneous and incomplete results.

IV.   Learning Analytics and University Library

Greller and Drachsler (2012, p. 52) state that evaluating a students' performance only with data obtained through learning management systems is like looking at a single piece of the puzzle. Therefore, it is clear that university libraries, which constitute a very important part of contemporary education, are the primary implementation area of learning analytics.

It is known that university libraries serve their users electronically through websites, automation systems and information retrieval systems. Additionally, libraries, which also benefits from frequently social media applications, have numerous datasets which are attained from various systems and platforms. In parallel with the services provided by university libraries, explaining the elements that will form input to learning analytics is important in terms of determining the contributions of libraries to learning analytics. These elements are:

Web sites: Various services are offered to users on the websites of university libraries. Libraries have exceeded traditional websites and started to serve through advanced systems. These services can be listed as follows:

- Information about the library and its services,
- Sharing announcements, news and events,
- Units, personnel and contact information,
- Structured forms for user-library interaction,
- Search field integrated into the interface for information discovery and catalog browsing,
- Navigator for discovery of subscribed and purchased resources,
- Online reference services for user assistance.

Automation system: Systems that provide the information source and the user-library relationship are automation systems. The processes of defining information resources (cataloging, classification, etc.) by librarians are carried out through automation. In addition, OPACs used by users for resource search and devices used for book borrowing & circulation work in integration with the automation system.

Discovery tools: Although both library websites and automation systems provide a window to access the information resource, Discovery tools developed for easy discovery and access of all resources the library subscribes to or owns are widely used.

Social media applications: It is obvious that university libraries, which frequently make use of social media applications, have a large amount of data on these platforms. There is interaction data waiting to be discovered on these tools where users interact with each other and with libraries. Analyzing the data on these tools used by libraries with various methods will help libraries and their affiliated institutions to decide and develop strategies.

In addition, it can be predicted about students' learning experiences by analyzing the processes (notes, highlights etc.) that readers carry out on electronic information sources, which they use, and these analysises can be used for improvement of personalized learning enviroments.

Libraries are important units for universities and librarians are committted to enhancing student learning and success. However, most university libraries have opted out of learning analytics initiatives in institutional level. Nevertheless, it seems possible that librarians will involve in corporate analytics practices by guiding the ethical use of learning analytics to increase students' success (Oakleaf, 2018, p. 6).

Nicholson, Pagowsky and Seale (2019) state that researchers and practitioners have been working on library learning analytics in recent years. Additionally, he says that professional associations such as the Association of College and Researc Libraries (ACRL) are also involved in the process. The authors state that it is possible to obtain real results with scientific methods, based on the desire to know and control the future in the face of uncertainties thanks to library learning analytics. Therefore, it is emphasized that it will be important for libraries to utilize learning analytics to make risk planning, determine vision and create strategies.

Since the activation of learning analytics and educational data mining applications on the library systems and it is possible to determine the information seeking behavior of users and services they need most, libraries can be made to see their missing or problematic aspects and to do the necessary works to increase the service quality. In addition, in design of individual learning systems, establishing a library relationship, presenting the potentially needed source of information to readers through personalized systems by examining learner behaviors (especially information seeking behavior) is an important issue. In other words, providing library integration to e-learning platforms to create personalized learning enviroments and evaluating the use of learning analytics in this context is important in terms of the integrity of application.

Jantti and Heath (2016, pp. 208-209), highlight the importance of utilizing library usage and interaction data in new learning analytics models and state that a new perspective will be gained in increaing the learning experience and academic performance of students with the inclusion of libraries in learning analytics. Researcher, who claim that library data is an important component among learning analytics datasets, expresses that data obtained from learning analytics are used to improve the students experience.

Greller and Drachsler (2012) constructed the framework of learning analytics as in Figure 6. Accordingly, learning analytics consists of 6 main elements. These elements can be evaluated in the context of the university library as follows:
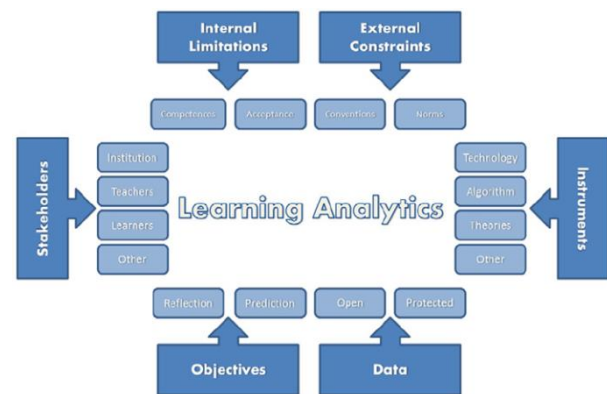

Fig. 6. Learning Analytics Framework (Source: Greller and Drachsler, 2012, p. 44).

1. **Stakeholders:** Institutions, educators, learners and their families constitute stakeholders of learning analytics. As a result of the actions taking place on the library electronic systems (website, automation and information retrieval systems), digital traces of students, researchers, instructors or staff of the institution are encountered.

2. **Objectives:** Learning analytics, aims that hidden informations are revealed by discovering traning data. Analysis of system and interaction data on library websites and information retrieval systems can help libraries and their affiliated institutions to develop reflexes, predict and make desicions. Watching the flow of information, information sharing and social interactions can provide understanding of new insights.

3. **Data:** Learning analytics take advantage of educational data on learning enviroments. Libraries are institutions that support learning. Therefore, datasets that emerge while learners use the library are very important. If the learning analytics discipline, which promotes individual learning and flexible learning enviroments, ignores the importance of libraries' role in this regard, the analytics performed may not give accurate results. Including datasets from libraries, joining together existing datasets will contribute to student-focused services and the development of personalized educational mixed applications.

4. **Instruments:** In the line with the purpose of learning analytics, different disciplines and technologies are

used in the development of educational services and applications. Educational data mining, machine learning, statistical analysis techniques, social network analysis can be regarded as the instruments of natural language processing learning analytics. These techniques can be beneficial for discovery, analysis, presentation and use of data on library systems and social networks.

5. External constraints: Learning analytics face with many different constraints. We can list these constraints as legal, ethical and social constraints. University libraries have fallen behind their institutions in implementing learning analytics applications. Partly institutional barriers and that data can not been used owing to insufficient infrastructure, university policies, privacy and privacy concerns can be given reason to this situation (Robertshaw and Asher, 2019). There are serious debates about privacy, data privacy, ethical problems, data security and sharing datasets on library learning analytics in literature. The libraries which are responsible for protecting the privacy of user data at the highest level face ethical and moral debates about use of data attained from leraning analytics and minning applications. Briney (2019), mentions that user privacy may be weakened and completely eliminated in library learning analytics applications unless the data which attain from university libraries are used correctly. Jones and Salo (2017) cite from ethical problems cope with learning analytics and that data mining applications are at odds with American Library Association's "Code of Ethics ". Because, protecting the privacy and confidentiality of user data on library systems is important to adhere to ethical principles. In addition to this, protection of intellectual property rights and observance of copyright among library users, institutions, content creators and vendors (commercial companies) is among the issues that need to be considered.

6. Internal Limitations: It is obvious that new high level competencies are required in order to implement learning analytics and gain efficiency in the learning -teaching process. Interpretation, critical evaluation and some high level competencies are required in order to make learning analytics an effective tool for education applications and to use learning analytics data in the most appropriate way. Additionally, the limitation of learning analytics applications with learning management systems, ignoring elements which are useful and support education such as libraries limits the gains that can be obtained from this discipline and reduces the quality of the application.

Learning analytics, which are used to improve the learning process in universities, are interested in learning management system, student information system and other systems related to education and focus on increasing the quality of learning process. That personalized training platforms and learner-oriented systems by evaluating the data obtained are developed is possible. However, ignoring the data sets on the library electronic systems, both within the framework of learning analytics business process and in the implementation of learner-oriented systems, may cause that applications to be implemented and the systems to be developed to be incomplete and reveal erroneous results.

V.   Conclusion

Universities have large amounts of data on electronic systems they have. The most important of these systems for learning analytics is undoubtedly the learning management system. Nevertheless, learning management systems alone are not enough to examine, avaluate and predict learner behavior. Including useful data sets that can be obtained from other systems that support education into the learning analytics business process will contribute to the better planning and improvement activities targeted by learning process analysis.

Data mining, which is an interdiscipllinary tool, that emerges with technological developments, is a discipline based on discovery, analysis, display, reporting of data and taking measures and making improvements depending on the purpose. The purpose of educational data mining, which is particularly concerned with data in learning enviroments, includes analysis towards improving learning enviroments, developing policies and strategies on education and improving learner situation. Educational data mining, which constitutes important part of learning analytics application processes, can be used on both learning management systems and other learning enviroments.

There are a large number of datasets waiting to be discovered and evaluated on websites, information retrieval systems and social media tools where university libraries, which are a complementary and supportive unit education, can interact with their users. In addition, the notes taken by readers on the electronic information resources they utilize, places they see important and emphasize, the sections they read and benefit from can be used to improve the learner experience for personalized learning systems.

In the long run, that learning management systems and systems which are used by other university units carry on their tasks by gathering under a single roof will pave the way for the emergence of an integrated and easy to understand ecosystem. This situation will increase the importance of learning analytics and learning analytics will become easily applicable without the need for additional applications and tools. Thus, the quality of education and connected services provided at universities will automatically increase.

On learning analytics applications, there are privacy, confidentiality concerns, protection of personal data and such concerns. Despite all these ethical concerns, it has become possible to maintain learning analytics by protecting and guaranteeing the privacy of users and data privacy with today's technological possiblilities. Creating systems that allow to be evaluated general reports by educators, administrators or policy developers and to be presented the users by interpreting personal data by machines in individual reporting can enable to protect

user privacy.

As a result, learning analytics is an evolving discipline. Factors such as difficulties especially encountered in applications, concerns over the privacy of personal data, whether datasets to be obtained by the techniques and methods to be used are useful, the difficulty of evaluating the data obtained from different learning anviroments as a whole, reveal that the discipline of lerning analytics needs to be improved. In this process, there is a necessity to analyze the learner data on library information systems and their e-resources in order to improve the level of learner education and increase individual learning success in universities. However, being enabled many sources of information owned and subscribed by libraries from external makes it difficult to obtain data. Therefore, being gotten absolute result from learning analytics applications oblige that the issue is analysed by discussing with all stakeholders across the global.

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