

## SMARTx: The Next Generation Learning Management System

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### ABSTRACT

*With the present pandemic situation, to continue the teaching-learning process, remote education and eLearning is essential. Content creation, content delivery, assessment and feedback are the four pillars of the remote teaching-learning process. Learning management system (LMS) is an engine which powers the remote teaching-learning process by automating content delivery, assessment and feedback stages. Although LMS offers a set of advantages, there are some demerits of the same. After a detailed analysis of eLearning and keeping demerits of present LMS, SMARTx learning platform is developed by Mr. Ashish Hulle. It offers a lot of advantages over present LMS and hardly has any demerit. Detailed discussion on different LMS available, merits and demerits of available LMS software, SMARTx platforms and features of SMARTx platform has been carried out in this paper.*

**Keywords:** LMS, Online Learning, Pedagogy, SMARTx, etc.

### I INTRODUCTION

Presently the entire world is fighting against COVID-19. One cannot predict when this COVID-19 pandemic situation will come to end. Keeping this in mind, there is a need to shift all teaching, learning and training practices online oblige for the security of students, teachers, and workers or employees. To shift the teaching-learning process online one has to take the help of a learning management system (LMS). Learning management system is a software system that can be used for educational content delivery, assessment, administration, documentation, tracking, reporting, automation of the same. LMS concept has emerged from e-Learning [1][2]. Most of the learning management systems are focused on online learning delivery with a different set of features in asynchronous and synchronous modes. In asynchronous mode, the teacher or instructor can upload the course content and learners can watch or use the content at any time. In asynchronous mode, both instructor and learners are online and knowledge transfer occurs. Both asynchronous and synchronous modes have their own advantages and disadvantages. Even though LMS offers great advantages, there are a lot of loopholes and disadvantages of the same. Keeping all things in mind authors designed one of the unique LMS called SMARTx. In this manuscript, the detailed discussion has been carried out on different LMS, their advantages, disadvantages and SMARTx learning platform.

### II LIST OF TOP LEARNING MANAGEMENT SYSTEMS

Based on user satisfaction (reviews & ratings), social media buzz, online presence, and other relevant information following learning management systems are ranked.

- (a) Paradiso Solutions
- (b) iSpring Learn
- (c) Easy LMS
- (d) Talent LMS
- (e) Litmos LMS
- (f) Moodle

- (g) CANVAS LMS
- (h) Lessonly
- (i) Teachable
- (j) LearningStone
- (k) NEO LMS
- (l) Tovuti LMS
- (m) eLucid
- (n) Innform
- (o) MagicBox
- (p) JollyDeck
- (q) EduBrite
- (r) Trainual
- (s) WizIQ
- (t) Skillo
- (u) Kiwi LMS [3]

### III THE IMPORTANT BENEFITS OF LMS

There are six major advantages of LMS: interoperability, accessibility, reusability, durability, maintenance ability and adaptability, which in themselves constitute the concept of LMS [4]. LMS makes the learning super-easy for learners as it helps in organizing eLearning content in one location. Use of multimedia eLearning material content like video, images, audio and text etc. serve as great tools in learning new skills or information which makes learning fun, engaging and exciting. One can deliver the eLearning content in a systematic way. LMS provides unlimited access to eLearning materials. Once the instructor uploads learning material on LMS, the learner has unlimited access to the content at any time. This enables the inclusion of worldwide learners to learn at their own pace at the desired time. Instructors or teacher need not deliver the same lecture or information again and again LMS does it for him/her. Hence instructor/teacher can get more time to create new content. Also, they can experiment by applying completely different learning techniques like blended learning, social learning, storytelling etc. Teachers/instructors can modify the eLearning material, and learners can see the updated material. LMS enables communication and facilitated the collaboration between people, as student and teacher/instructor can

communicate on a streamlined topic on single-channel/platform. All the information about the teaching-learning process is available in a consolidated form with LMS. LMS automatically tracks learner progress and performance and inform the instructor about the same. At a glance, one can analyze the status of online learning programs; determine learners who have completed sure qualifications, and far more. LMS puts all coaching info at fingertips which eliminates paperwork and saves time. LMS saves money and as it reduces the overhead costs[5][6].

#### IV DEMERITS OF LMS

One-way content delivery may be boring for the learners. Depending on how it's set up, LMS can diminish the motivation of learners. Learners may not sit for a long time in front of the screen. Learners need to have a basic knowledge of technology to take lessons and complete assignments online. There is a lack of communicational skill in students as they are not interacting with peer learners and teachers as in the regular physical classroom. Prevention of cheating during online assessments is complicated. It is difficult for the instructor to monitor every learner to avoid malpractice by learners during an online assessment. Also, learners may copy content from other resources to complete their assignment. This leads to plagiarism. Some student may simply skip watching the online video or may not watch it regularly or there is a chance that they may finish everything in one day itself. With such kind of malpractice, the learning objective is not fulfilled. With LMS education theoretical knowledge is imparted to students largely, rather than practical skills. One has to have good internet connectivity and suitable gadget (smartphone/tablet/laptop/desktop) to access the content. Low-quality affirmation and an absence of authorizing learning material keep on debilitating the authenticity of online learning[7][8].

#### V SMARTX ONLINE LEARNING PLATFORM

SMARTx is an online learning platform founded by Mr. Ashish Hulle, where one can learn many skills as per the requirement of an individual at their own pace. SMARTx is inspired by the increase in the demand by the people to learn online. SMARTx platform is an attempt made to transform traditional education to modern education with the novel learning pedagogy and features like learning by doing, peer learning, assignments, quizzes, live lectures, web conferencing and online internship. The learner can enroll in any interesting course and can get a verified certificate after completion of the course. The mission of SMARTx is to make learner smart and skilled so that learners can excel in their respective field. SMARTx platform can be accessed by visiting <https://smartxlearning.in>.

Key features of SMARTx include hybrid learning (self-paced courses and live class), interactive videos, interactive whiteboard for a live class, online meeting/web conference system, content seeding, automatic course tracking, a robust online examination system, online assignment submission, automatic plagiarism check for assignments, chat for real-time discussion, discussion forum, uses achievement badges, e-certificate, course feedback, grade book, real-time student activity reports, etc. The detailed discussion has been carried out on these key features in the following points.

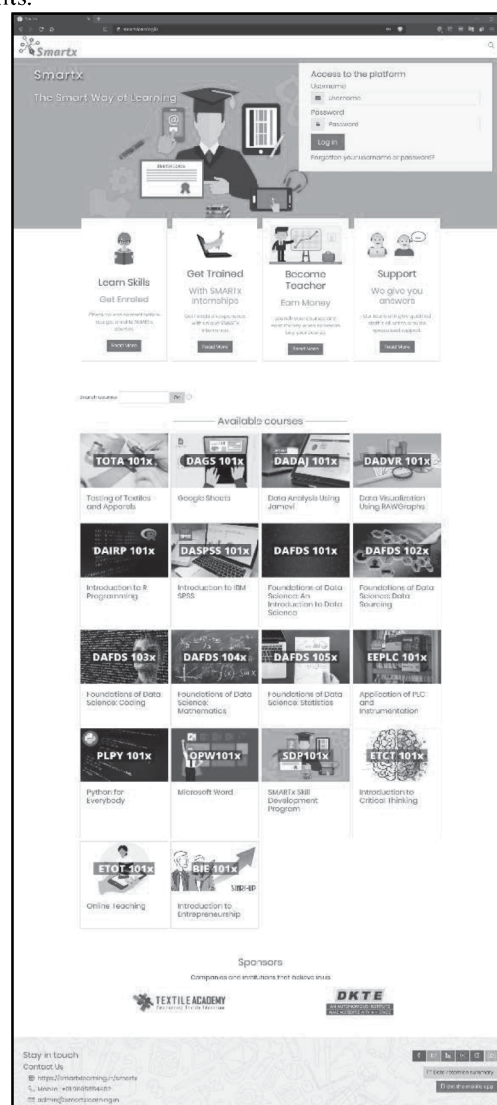


Fig. 1 SMARTx Home Page

#### VI HOW DOES SMARTXWORK?

The home page of the SMARTx can be accessed by the user from the browser by putting SMARTx URL: <https://smartxlearning.in>. Usually includes information about the courses and internships offered by SMARTx along with login box. How students enroll in different courses and internships can be decided by the course administrator. Available options are self-enrollment by

students, manual enrolment by a teacher or automatic enrolment by SMARTx admin. Each user has their own customizable Dashboard. What a user sees on SMARTx dashboard depends on their role and rights granted to them by the administrator. However, Courses which are organized into different course categories can be seen by every user. Learners can select enrolled courses and start can start their learning immediately.

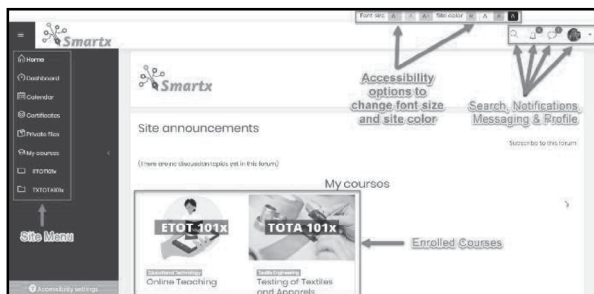


Fig. 2 SMARTx After Login Screen

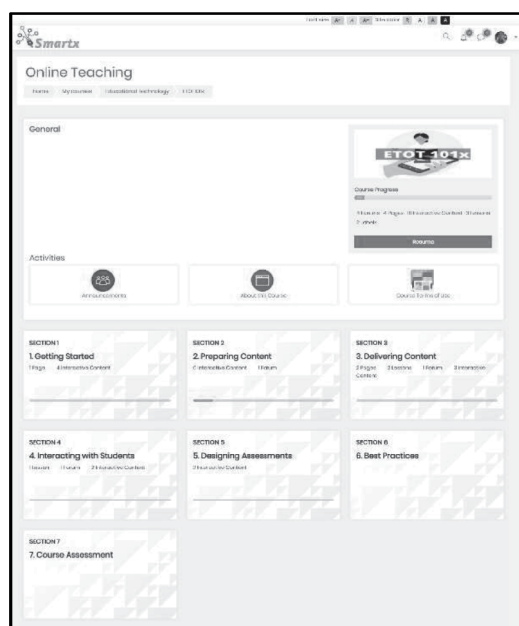


Fig. 3 Course Content View

## VII SMARTX FEATURES

SMARTx platform has been developed and evolved by keeping the disadvantages of current learning management systems. It combines all the advantages of top learning management systems and has no demerit. Unique course presentation style and high versatility are the USPs of this platform. SMARTx can meet all the needs of student, teacher or course/training manager. SMARTx is extremely customizable and has many standard features. In the following points, the features of this platform are described.

- **Personalized Learning Experience:** SMARTx platform can be used to give customized learning experiences for the learners. Teachers can customize the learning path for the students. One can understand how

personalized learning can be facilitated using SMARTx following example is cited. Consider learner wants to attempt a quiz directly, without reading a particular course material or lesson, SMARTx course can be set up to notify/alert the student instructing to read the same before taking the quiz. In the same manner, if a student attempts a quiz and obtains marks less than 60%, SMARTx can be set up to redirect that student to remedial content automatically. On the other hand, if a student performs well in quiz, i.e. if he/she scores more than 90%, he/she will be redirected to next lesson/learning material. Of course, a lot of flexibility is given to the teacher. SMARTx puts no limitations on customizing learning paths. Teachers can configure the platform for the particular course according to their own way.

- **User Interface:** SMARTx has a modern and responsive user interface. SMARTx interface is easy to navigate on a smartphone, tablet as well as on desktops. On user dashboard information pertaining to current, past and future courses, along with tasks due is displayed by default. Also, they can personalize their dashboard.
- **Accessibility Control:** SMARTx is the only platform with accessibility controls. One can change the site color as well as font size as per the convenience.



Fig. 4 Accessibility Settings

- **Course Activities:** SMARTx has an array of different tools that includes Quizzes, Assignments, Chat, Forum, Survey, Feedback, Workshop, Glossary, Wiki, Book, etc. All these tools can be used by respective teachers in a particular course for taking exams, for giving assignments, course content, extra information and to enable collaborative and peer learning experience for students.
- **SMARTx Calendar:** To keep track of academic activities, deadlines, and other personal events, users can take the help of automated SMARTx's calendar tool. All the course-related activities, due dates etc. are automatically added to the SMARTx calendar.

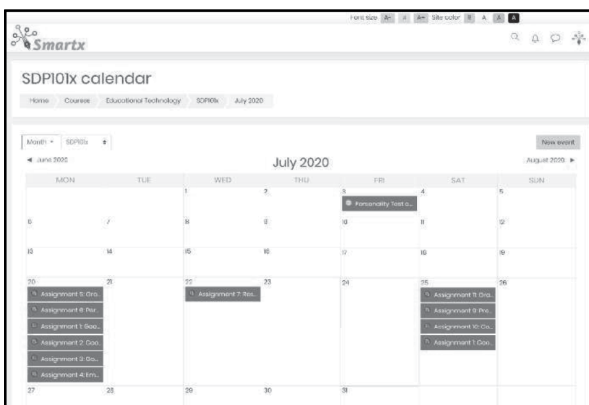


Fig. 5 SMARTx Calendar

- **File Management:** Students can manage their personal files and notes with simple drag and drop feature. Also, they can import files from different cloud storage services like OneDrive, Google Drive, Dropbox etc.
- **Word Editor:** SMARTx has an intuitive and simple word editor. Users can do text formatting easily and can conveniently add all type of media files with an editor into a course or in assignments.
- **Forum and Messaging:** Educators and learners can send private messages to one another using messaging feature and can discuss on the common topic using SMARTx forum.

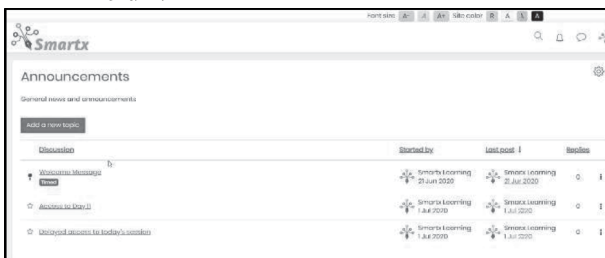


Fig. 6 SMARTx Forum Posts

- **Notifications:** SMARTx is enabled with automated notification and alert system. Learners get alerts on new forum posts, deadlines and new assignments.
- **Automated Course Tracking:** SMARTx can track course completion and course progress as well as different course activities. SMARTx automatically tracks grades, activity completion, course completion, etc. This information is useful for educators and learners in different ways.

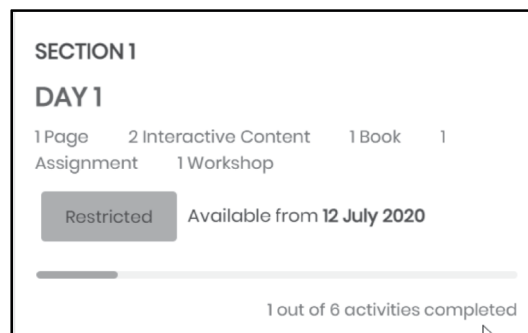


Fig. 7 SMARTx Course Section with Activity List and Completion Tracking

- **Authentication and Enrolment:** SMARTx has over 45 authentication and enrolment options for user enrollments to courses and internships.
- **Multilingual Capability:** SMARTx has Multilingual capability. One can view course content and learn in the preferred choice of language.
- **Gradebook & Rubrics:** SMARTx has advance gradebook and enabled with the criteria-based assessment.
- **Course Backup and Restore:** For the safety reasons one can take course backup and can restore at any time. So that there is no chance of data loss and rework.
- **User Role Management:** SMARTx is having user role management facility. Admins can define roles to specify and manage user access.
- **SCROM Support:** On SMARTx platform one can import and export IMS-LTI, SCORM courses.
- **Security:** Connection to SMARTx is encrypted and has secure access to the site. SMARTx is regularly updated with the latest security patches.
- **SMARTx Web Conferencing System:** To facilitate synchronous learning i.e. live online classes, SMARTx has its own webconferencing system. With this teachers can share their screen, audio, video, slides with students. One can record online lectures as well. Built-in polling system makes the class engaging. It also has a whiteboard tool which can be used to explain concepts, real-time annotations are also possible.

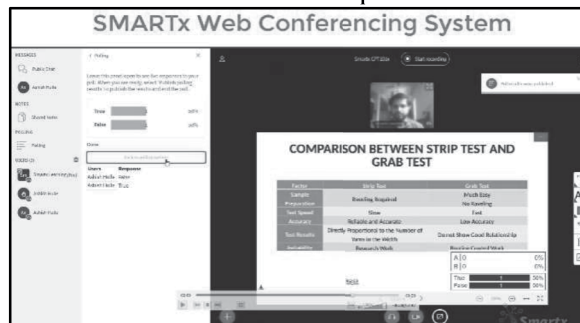


Fig. 8 SMARTx Web Conferencing System



- **Safe Exam Browser:** SMARTx exams/quizzes can be conducted using a safe exam browser. Common browser features like search, back/forward navigation, refresh, the addition of new tab, closing exam tab, switching applications, all shortcut keys, print screen, clipboard, browser menu, etc. are disabled. The browser cannot be closed until the test is submitted. This adds an extra layer of security during assessments.
- **Course Development/Management:** Instructors/teachers can easily design any kind of course/classes like instructor-led, self-paced, blended or entirely online. Hence a single SMARTx platform can fulfil the requirements of all types of courses.
- **Collaborative Learning:** SMARTx has multiple collaborative publishing features that can foster student engagement and content-driven collaboration. It can be further strengthened by grouping the learners for sharing courses and distinguish activities which lead to teamwork.
- **Peer learning and self-assessment:** SMARTx workshops and surveys are the two tools which facilitate the peer learning and encourage students to view, grade and assess the work submitted by co-learners or their own. In this students has to submit his work according to guidelines given by the teacher. Upon submission, the student gets the submission from other co-learners which they suppose to assess according to teachers guidelines. This enables indirect learning from peers.

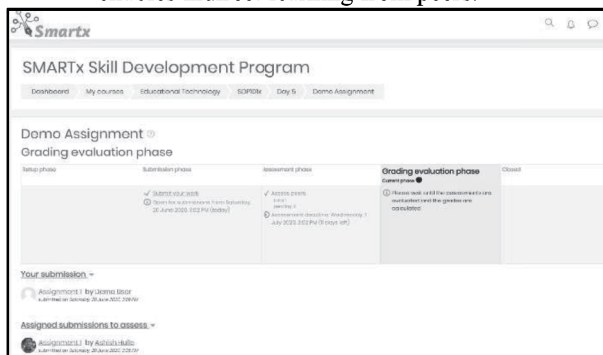


Fig. 9 SMARTx Peer Evaluation

- **Badges:** To reward the learner participation and their achievements in grades or activities automated customized Badges can be given to them. This motivates students and keeps them engaging.
- **Verified Certificate:** Every learner who completes the course or internship on SMARTx gets verifiable e-certificate. One QR code is placed on the certificate that can be scanned by anyone to check the authenticity of the certificate.



Fig. 10 Example of Verifiable Certificate

- **SMARTx User Profile:** Every SMARTx user has his own profile tab along with some right to customize SMARTx platform for their own suitability. The user profile has multiple fields wherein people can add a profile picture, bio, etc. All their forum posts, individual blogs, overall activity reports, activity statistics, courses enrolled, certificates earned, course progress, etc. is shown at one place.

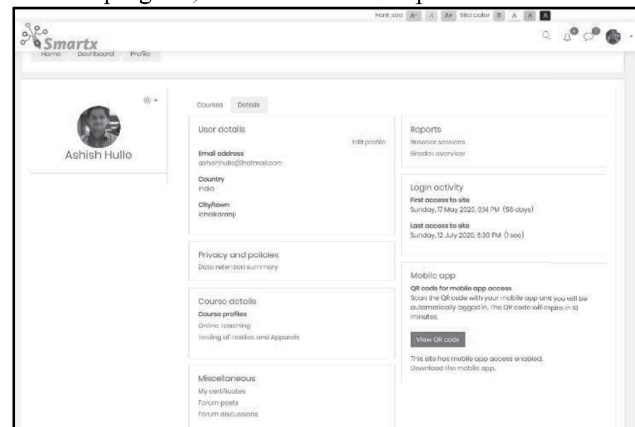


Fig. 11 SMARTx User Profile Section

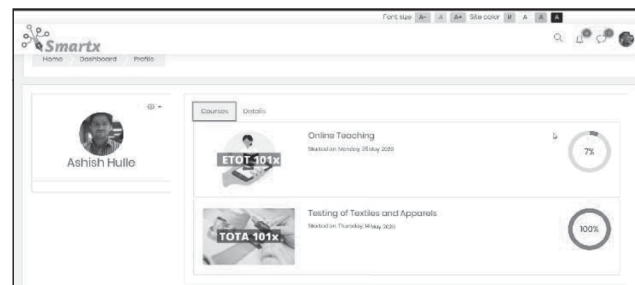


Fig. 12 Course Completion Status in Profile

- **Reporting and Analytics:** Detailed reporting and logsof different activities can be viewed and generated at any time. Instructors/Teachers can get the activity reports of every student enrolled for the course. These reports incorporate insights and graphs regarding every

module and every activity of student like last access, a number of times read. Thus, for instance, the educator will see the detailed activities of every learner in the online course. Which pages every learner has seen and how frequently, and what undertakings have been finished. This is exceptionally useful in giving help to learners who are encountering issues.

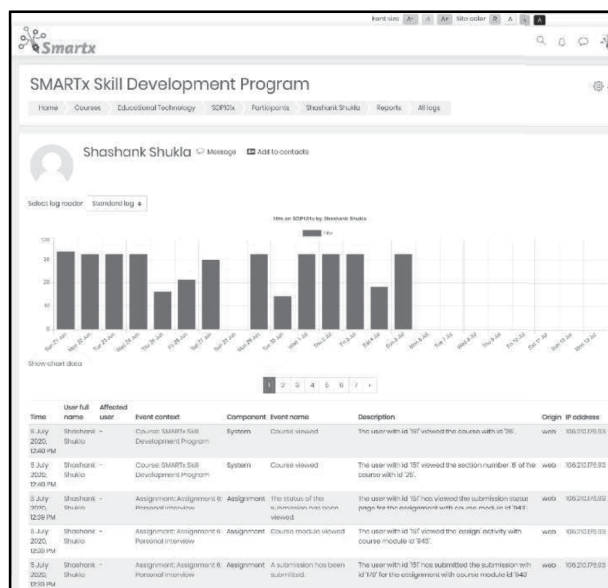


Fig. 13 User Activity Logs

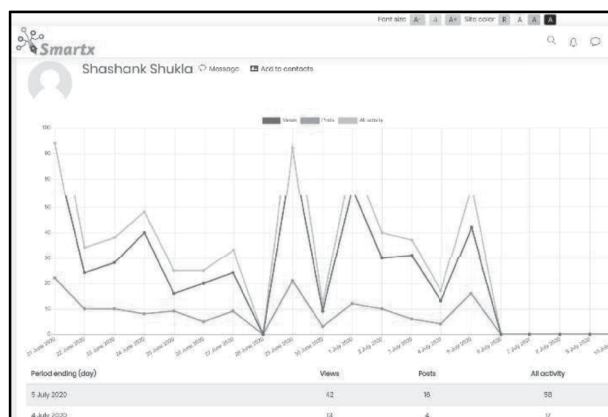


Fig. 14 User Statistics

- **AI and Analytics:** SMARTx platform is integrated with artificial intelligence. Descriptive, predictive, diagnostic and prescriptive analytics report is generated on SMARTx automatically.

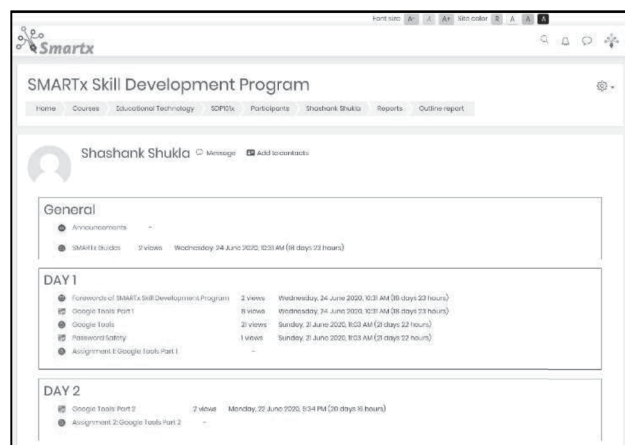


Fig. 15 User Outline Report

## VIII CONCLUSION

SMARTx platform fulfils all the gaps in digital learning and has overcome the demerits of most of the learning management systems. In this uncertain pandemic situation, learning management systems like SMARTx are really helpful for academia to continue the real lifelike teaching-learning process for all academic levels.

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