

Research Proposal

Data-Driven Pedagogy: A Holistic Exploration of Learning Analytics to Elevate Educational Effectiveness.

Abstract

This research explores the integration of learning analytics into pedagogy, aiming to elevate educational effectiveness. Through a holistic investigation, utilizing descriptive, predictive, and prescriptive analytics, the study analyses historical and current data to uncover patterns in teaching methodologies and student behaviours. The research seeks to forecast student performance, recommend personalized interventions, and compare the impact of data-driven pedagogy against traditional approaches. Anticipated outcomes include insights that empower educators to enhance teaching strategies, improve student engagement, and foster a personalized, adaptive learning environment, contributing to the ongoing evolution of effective educational practices.

Introduction

In the evolving education landscape, the integration of technology and data-driven approaches is reshaping pedagogical practices. Learning analytics presents a transformative opportunity to revolutionize teaching methodologies and improve educational outcomes[1]. This research is driven by the imperative to unlock the potential of data-driven pedagogy, fostering personalized learning experiences and utilizing advanced analytical tools for profound insights into student behaviors, tailored interventions, and enhanced overall educational effectiveness.

Objective

The primary objective is to conduct a thorough investigation into the utilization of learning analytics within pedagogy. This involves understanding the impact of data-driven insights on teaching methods, student engagement, and learning outcomes to contribute valuable insights to educational practitioners and policymakers.

Methodology

Data Collection: Collect diverse datasets, including student performance metrics, engagement data, and pedagogical methodologies. Utilize learning management system (LMS) data, assessments, and feedback records.

Descriptive Analytics: Employ descriptive analytics to analyze historical data, revealing patterns in teaching methodologies and student learning behaviors. Examine existing practices and identify areas for potential enhancement.

Predictive Analytics: Develop predictive models to forecast student performance based on historical and current data. Identify factors influencing academic success and predict potential challenges[2].

Prescriptive Analytics: Implement prescriptive analytics to recommend personalized teaching interventions. Provide actionable insights for educators to adapt pedagogical strategies based on individual student needs.

Expected Outcome : The research anticipates uncovering insights that can revolutionize educational practices. By holistically exploring the integration of learning analytics into pedagogy, we aim to provide educators with practical strategies for enhancing teaching effectiveness, improving student engagement, and fostering a more personalized and adaptive learning environment.

Duration : 6 – 8 Months

References

- [1]. B. Tm. Wong and K.C Li, "A review of learning analytics intervention in higher education (2011–2018)", *J. Comput. Educ.*, vol. 7, pp. 7-28, 2020.
- [2]. Christothea Herodotou, Claire Maguire, Nicola McDowell, Martin Hlosta and Avinash Boroowa, "The engagement of university teachers with predictive learning analytics", *Computers & Education*, vol. 173, 2021.

This course encompasses a spectrum of vital topics, from leadership honed through analytical excellence to the practical applications of strategic implementation and analytics administration lifecycles in the workplace. Participants will engage in immersive sessions exploring professional perspectives in business analytics, complemented by hands-on experiences in creating dashboards using industry-leading tools such as Tableau or Power BI. The course delves into the nuances of descriptive, predictive, and prescriptive analytics, providing practical insights into problem-solving in domains like supply chain management and logistics optimization. We are enthusiastic about providing participants with a comprehensive understanding of business analytics, ensuring they are well-prepared to navigate challenges in today's data-driven landscape.

Learning Objectives

1. Foster distinctive leadership skills by synthesizing analytics for strategic decision-making and organizational impact.
2. Demonstrate comprehensive understanding of data analytics by strategically implementing and administering analytics lifecycles in the workplace.
3. Apply hands-on expertise in creating dashboards, employing data-centric methodologies, and solving challenges in diverse domains.

Pedagogy : Lecture, Hands-on, Case study

Session#	Topic	Reading Material / Case Study
1.	Forging Distinctive Excellence in leadership through Analytics	A data-driven decision making approach for business. Product #: BEP500-PDF-ENG
2.	Comprehensive Insights into Data and Business Analytics	Business Analytics: The Science of Data-Driven Decision Making" by U. Dinesh Kumar
3.	Strategic Implementation and Administering Analytics in workplace: The Lifecycle of Analytics	Lecture with Caselets
4.	Categories of Business Analytics: A Professional Perspective	Business Analytics at a Glance From Business Analytics, Volume II: A Data-Driven Decision-Making Approach for Business -By Amar Sahay - (A Business Expert Press Book) Product # BEP498-PDF-ENG
5.	Good Charts	Good Charts: The HBR Guide to Making Smarter, More Persuasive Data Visualizations by Scott Berinato, (HBR Book) Product #: 15005-PDF-ENG
6.	Leveraging a data-centric methodology to address challenges in human resources	HBS Case Discussion - APTURJA POWER LIMITED: HUMAN RESOURCES ANALYTICS - Product # W21016-PDF-ENG
7.	Creating dashboard through Tableau / Power BI	Hands – on
8.	Educational Game Simulation – Machine learning concepts	Machine Learning Concepts: An Educational Game Simulation - Product# : SMU064-PDF-ENG
9.	How to win with machine learning	HBS Article Discussion
10.	How to fix the package price at Mission Hospital	Package Pricing at Mission Hospital Product #: IMB527-PDF-ENG
11.	Analytics in Finance	HBS Case : Moss & Associates: Accounting for Financial Fraud
12.	Big Data: Technology and Applications	Lecture with caselets
13.	Utilizing Text Analytics in the Workplace: Practical Applications	Hands-on
14.	Customer Use case in Text analytics	Hands-on
15.	Challenges that Organizations Face in Analytics	HBS article discussion Why So Many Data Science Projects Fail to Deliver, MIT Sloan Management Review, 2021



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A versatile Ph.D. graduate with a strong academic background and 14 years of teaching experience. Bringing 12 years of hands-on global software development expertise, a proven track record is evident in creating innovative solutions. Proficient in research, owns 25+ papers published in international journals and actively participated in conferences.

Enthusiastic to participate in collaborative efforts to advance educational initiatives and nurture an environment of academic excellence, possessing expertise in Computer Science and Business Analytics..

EDUCATION

- **Ph. D**, Computer Science, *Bharathiar University*, **2019**
- **M.Phil.**, Computer Science *Bharathiar University*, **2013**
- **MCA** – Computer Application *Bharathidasan University*, **1996**
- **B.Sc. – Mathematics** *Bharathidasan University*, **1993**
- **Pursuing MBA – Operations & supply chain at Pondicherry Central University**, **2022**

HIGHLIGHTS

1 Funded Project

6 Patent

16 Scopus Indexed

12 Invited Talk

1 Copyright

12 Projects

TEACHING

- Fundamentals of Business Analytics
- Machine Learning/Predictive Analytics,
- Statistics for Managers, Text Mining
- Security Management in Cloud
- Python & R Programming
- Data Visualization, DBMS
- Business Intelligence & Technology
- C# & .NET, JAVA Programming
- Data structures, Operating Systems
- IoT, Cloud Computing

SKILL

- Python, Tensorflow, Keras, Pytorch, Sklearn, R Programming
- Tableau, PowerBI & SQL
- Building Machine Learning, Deep learning & NLP Models
- C# & .NET, JAVA Programming
- Github, Confluence, JIRA

PROFESSIONAL SYNOPSIS

- Proficient in various basic and advanced theory, practical courses for MBA / MCA / M.Sc / B.Tech .
- Steered efforts in identifying student's learning needs, and developing customized learning solutions by utilizing latest educational theories.
- Guiding capstone project and master thesis in various domain
- Guiding PhD Research scholars in Visveswaraya Technological University
- Board of Study, Board of Examiner and Reviewer board member for reputed colleges and International Conferences affiliated with leading avenues.
- Hosted various workshops and technical symposium
- Experience in architecting applications with Machine Learning, Deep Learning Convolutional Neural Network and Python.
- Skilled in libraries such as Sklearn, Numpy, Pandas, Matplotlib, C#, ASP.NET, SQL Server
- Rich experience in all phases of the software development life-cycle (requirements, design, development, testing, release, support), utilizing multiple development methodologies.
- Experienced Scrum master with a keen ability to understand and build complex systems.
- Implemented agile methodologies using a Scrum framework throughout the organization
- Good Communication skills, Interpersonal skills, Flexible, Fast learner, and ability to work effectively independently and perform as part of a team.
- Excellent abilities to understand functional requirement to convert into technological product using requisite tools.

RESEARCH

- Machine Learning , Deep Learning , NLP
- Supply Chain Analytics
- Learning Analytics

WORK EXPERIENCE (Academic)

Christ University, Bangalore	Associate Professor	Feb 2022 to Till Date
CMR Institute of Technology, Bangalore,	Associate Professor	Oct 2015 to Feb 2022
Karunya University, Coimbatore,	Assitant Professor	Jun 2011 to Sep 2015
Dr. Mahalingam CET, TamilNadu	Sr. Lecutruer	Jun 2010 to May 2011
SNS College of Engg, Coimbatore,	Lecuturer	Jun 2009 to May 2010

WORK EXPERIENCE (Industry)

Accuwrite Forms And Systems, India	Software Engineer	Jan 2005 To May 2009
Abacus International Pvt.Ltd., Singapore	Software Engineer	Sep 2000 To Dec 2004
Jma Ptd Ltd., Singapore	Software Engineer	Aug 1999 To Aug 2000
Focus Computers, India	Programmer	Jul 1996 To Jun 1999

FUNDED PROJECT - Development and Evaluation of a framework for implementation of Learning Management System in Government Schools in Karnataka as a concurrent extension of eVidya

Funded by ICSSR -Indian Council Of Social Science Research, Govt. of India **Designation** : Co-Project Director.

Amout : 2 Million

Duration : 2 Years - On going

This research focuses on developing and evaluating a specialized framework for the concurrent implementation of eVidya, the government's digital education platform, and Learning Management Systems (LMS) in Karnataka's government schools. Utilizing a mixed-methods approach, the project aims to address unique educational challenges, foster digital transformation, and contribute significantly to improving education quality and bridging the digital divide in the state.

RESEARCH PROJECT - Review Opinion Mining ss(ROM) Classification Model using Soft computing Approaches - JUL 2012 to JUL 2019

Review Opinion Mining (ROM) Classification Model has been proposed based on soft computing approaches such as artificial neural network and genetic optimization algorithm-based opinion classifier are introduced. Proposed SWSF (Significant Word, SVD, and Filtering) pre-processing algorithm, GR-FFNN (Gain ratio Feedforward Neural Network) algorithm and Genetically Optimized GR-FFNN algorithm. Implementation is done in python using Anaconda. Resulted in five publications in Scopus indexed journal with high impact factor.

PATENT - Pulibshed 6 Utility Patents and filled 2 Design Patents

1. SMART IOT-ENABLED WATER TANK CLEANING AND MAINTENANCE SYSTEM FOR EFFICIENT AND AUTOMATED MAINTENANCE, on 27-Mar-2023 Patent #. 202341022092
2. IOT BASED SMART WET GRINDER SYSTEM FOR WORK FROM HOME COMMUNITYp on 28-Apr-2023, Patent #. 202341023028
3. AI-BASED REAL-TIME CLASS ENGAGEMENT EMOTIONS MONITORING SYSTEM ,on 23-Dec-2022, Patent No : 202241067059
4. SMART INTERNET OF THINGS (IOT) ENABLED AGRICULTURAL FARMING SYSTEM on 26-Aug-2022 Patent No : 202241047525
5. LPG STOVE CONTROLLER SYSTEM USINGINTERNET OF THINGS (IOT)' on 15th Sep 2020 – Patent No. 202041039856
6. BUILDING FAMILY TREE WITH BIRTH CERTIFICATE AND PRESERVING USING BLOCK CHAIN on 15th Sep 2020 - Patent No. 202041039900.

Research Database - Publications

OrclD	Scopus	Google Scholar
		
https://www.scopus.com/authid/detail.uri?authorId=57204880948 https://scholar.google.com/citations?user=7aJKA3kAAAJ&hl=en https://orcid.org/0000-0003-2896-7005		<p># of Publications : 26</p> <p># of Conference Presentation : 15</p> <p># Book & Book Chapter : 3</p> <p># Certification : 2</p>

Projects – Developed more than 12 projects some important projects

1. Research Paper Review System web application developed in .NET and SQL Server
2. Diabetes Onset Detection by using Deep Learning Grid Search - Batch size, Epochs, Learning Rate, Dropout, Initialization, Activation and Neurons selection.
3. Detection of Breast Cancer using Machine Learning Technique - Support vector machine (SVM) and K-Nearest Neighbour (KNN) classification techniques were used to detect Breast Cancer.
4. Conceptualized & implemented a sentiment analysis tool to rate the financial competence of companies
5. Stock Market Clustering using KMeans and PCA. In this project, unsupervised machine learning technique, K-means clustering used to a group of companies to analyze the similarities.
6. In a team of Six, implemented and tested Abacus Whiz V2.2.0 and 2.2.1, windows application provides travel agents with an easy and convenient way to access the Abacus Central Reservation System and the Abacus Global Distribution System, at Abacus Intl. Pt. Ltd., Singapore.
7. AbacusWhiz V 2.2.1 Customization in AMEX, at Abacus Intl. Pt. Ltd., Singapore.
8. Purchase Order System & Stock Inventory System, In a team of Two, Developed and deployed Visual Basic 6.0 applications with Sql server 2000 databases JMA Ptd Ltd., Singapore. Client - Atlantic Shipyard Pvt. Ltd. Singapore.