Library and information Science Education in View of National Education Policy -2020: Challenges and Opportunities

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Abstract

In the realm of educational transformation with the introduction of National Education Policy-2020 it opened up huge opportunity to restructure the existing LIS education curriculum. The profession which is struggling hard to cope with new technology powered by AI and machine learning. The paper argues the adaptation of new technology in order to align/integrate itself with this change. It also discusses the grass level problem in the execution of proposed course with solution.

Keywords *– National Education Policy, NLP, Blended Learning, LIS Education, Data Analysis, AI and Machine Learning.*



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Introduction -

As per the campaignforeducation.org "The Agenda-2030 is an inter-government commitment and **a plan of action for people, planet and prosperity**. It comprises of 17 Sustainable Development Goals (SDGs). These goals are indivisible and encompass economic, social and environmental dimensions. Education is at the heart of the 2030 Agenda for Sustainable Development: it is identified as a stand-alone goal (Sustainable Development Goal-4) and is also present as targets under other SDGs on health, growth and employment, sustainable consumption and production, and climate change. Sustainable Development Goal-4 (SDG-4) is aims to ensure inclusive and quality education and promote lifelong learning opportunities for all".

[https://campaignforeducation.org/en/key-frameworks/the-2030-agenda]

The Government of India has introduced a new National Education Polcy-2020 to aligned with the aspirational goal of Sustainable Development Goal of United Nation. The new Indian National Education Policy-2020 proposes the revision and revamping of all aspects of the education structure, including its regulation and governance, to create a new knowledge system that fulfil the Sustainable Development Goal (SDG-4), while building upon India's traditions and value systems. This New Education Policy -2020 of India is to replaces the thirty-four year old National Policy on Education (NPE),1986 for 21st century. As it claim that " the policy aims to transform India into a vibrant knowledge society and global knowledge superpower by making both school and college education more holistic, flexible, multidisciplinary, suited to 21st century needs and aimed at bringing out the unique capabilities of each student". (NEP-2020)



India has introduced its new education policy when the world is at the confluence of two immense revolutionary technologies i.e. Information Communication Technology (ICT) and Biotechnology which empowered by Artificial Intelligence. The merging of these two technology is drastically changing our world. Today, it is difficult to think about our world without Internet. Every time we active on Internet with any objective we create and left behind our digital footprints such unimaginable quantities of Big Data. The exponential ability of processing such huge data enable humans to control almost everything around us. The challenge posed by these revolutionary technologies is arguably much bigger than the challenge posed in the previous industrial revolution. We have no idea what will be the job market in just coming next thirty years. It is generally anticipated that no human job will ever be safe from the threat of automation and artificial intelligence (AI). This will change almost every line of works from the binding a book to reading it from the library. It believes that within a mere decade the billions of people will become jobless due to irrelevant to job market.

Twenty-first century marked as a knowledge era which is flooded by enormous amount of processed information and data. In this perspective it would not be exaggeration that the Library and Information Science, a profession which primarily deals with information may become irrelevant. This may have resulted into the mass unemployment which are not just socially but also academically redundant. The new National Education Policy-2020 gives us an opportunity to rethink and revamp the LIS Education in order to align the profession with such unavoidable revolutionary development. This paper is a sincere effort toward the same.



NEP-2020 and Professional Education

This new education polcy clearly express the expectation from the professional education as follow-

- Increasing the Gross Enrolment Ratio in higher education is the prime aim of the this policy. Hence it emphasizes on ensuring universal access to all discipline. This is to transfer the Indian education system into large, well resourced, vibrant multidisciplinary emplacement oriented system for all.
- The policy emphasise on broad based, multi-disciplinary, holistic Under Graduate education with flexible curricula, creative combinations of subjects, integration of vocational education and multiple entry and exit points with appropriate certification.
- All professional education will be an integral part of the higher education system.
- All Deemed and Stand-alone universities will aim to become multi-disciplinary institutions.
- The policy prescribes the application of Artificial Intelligence (AI), big data analysis, and machine learning in section 20.6 of III Part entitled as "Other Key Areas of Focus" to be woven into undergraduate education for enhancing the employability of the youth.
- Being a interdisciplinary professional education, Library and Information Science should align their curricula accordingly. Although, this would not be an easy for the professionals to adopt this new and vibrant challenge in existing scenario, but the principle of multiple access and blended learning tool of NEP-2020 itself offers some solutions. (NEP-2020)

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The Challenge before the LIS

The scarcity of information is not the problem rather the availability of the enormous information at a click away is the real challenge of the world. This make extremely difficult to access timely relevant information. The time consuming and complicated searching of information on internet sometime tempting the seeker to switch to funny, gossip or porn sites. In this age information era, giving more and more information or access to information sources to the users is of no use. They already have far too much of information. Instead, they need the ability to make sense of information, to figure out the difference between what is important and what is unimportant, and above all to combine many bits of information into a broad picture of the world. In this perspective the library profession should prepare for some immediate challenges such as -

1. Increasing demand of knowledge rather than information or mere sources of information from the users.
2. Conservation of knowledge instead of preservation of information.
3. Personalize services.
4. Application of Machine Learning instead of traditional bibliographical tools like indexing, cataloguing and classification, which are more probably useful for printed information.

In order to address such challenges, the library science students need to equipped with some most essential skills to survive in 21st century such as basic knowledge of programming especially Phython, Natural Language Processing, application of NLTK library, Text and Data Analysis etc. It is the responsibility of the LIS teacher and curriculum designer to adopt new skills of 21st century. Considering the existing model of LIS courses and the potential student population this paper tries to propose curriculum model in the light of new National Education Policy 2020.



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Flexibility in Teaching and Learning

The National Education Policy has given a rare glimpse in what can be achieved through the transformation of education. The new NEP clearly states that it is time to take on a policy that is undoubtedly student centric. It also promotes use of vocational courses, multi-disciplinary courses and multi-modal approaches there by focussing on Blended teaching-learning. The student centricity means that availability of multiple entry and exit points. The concept of the **ABC** (Academic Bank of Credit) that factors in the potential of time, place, mode, speed and language that in many ways is going to be the new approach of education.

In the realm of educational transformation, the Academic Bank of Credit gives sufficient elbow room for many things, especially keeping in mind such areas as flexibility and quality; interests and needs; student centricity; the real worlds of study and taking up examinations when ready. In other words, the student has been given the chance to pick teachers and timings; framing their own courses; designing degrees; studying through any mode and with learning and examinations literally on demand and at will.

[https://www.ugc.ac.in/pdfnews/6100340_Concept-Note-Blended-Mode-of-Teaching-and-Learning.pdf]

Current Scenario of Indian LIS Education

Jain and others (2007) gives the further details about current scenario of Indian LIS education. Presently in India, Library and Information Science (LIS) education is imparted through more than 118 universities and institutions. A total of 105 universities provide Bachelor of Library and Information Science (BLIS) courses, 78 universities provide the Master of Library and Information Science (MLIS) courses, 21 are offering two-



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year integrated courses, 16 universities provide M.Phil in Library and Information Science, 46 universities provide Ph.D in Library and Information Science and 2 Universities provide D.Litt Degree. Besides this, the National Institute of Science Communication and Information Resources (NISCAIR) which was earlier known as the Indian National Scientific Documentation Centre (INSDOC), New Delhi, and Documentation Research and Training Centre (DRTC), Bangalore, provide Associateship courses in Information Science, which are equivalent to the MLIS degree. (Jain, 2007) NEP has given focus on blended learning and disruptive technology. It has also noticed that many department has already incorporated the following points in their curriculum of LIS education.

Content Management System

- CMS: Concept, Definition and Scope, Benefit, Principals, Architecture
- CMS Tools/Software: Features and Functionalities of Drupal, Joomla, Wordpress, Moodle: Selection, Implementation and Evaluation.
- E-learning Platforms, MOOCS: Concept, Features and Functionalities
- SWAYAM Course: Concept, Features and Functionalities

Legal Issues

- IPR in Digital Libraries and LMS
- Copyright infringement, Licensing
- Fair use of Digital Information
- Creative Commons
- Plagiarism: Definition, Concept, Types, Rules
- Plagiarism Software: Urkund, Turnitin, iTenticate, OSS



Technological Trends

- Ontology – Tools (RDF, RDFS, Protégé)
- Semantic Web
- Linked data, Big data
- Data Mining and Harvesting
- Internet of Things

Application and Implementation

- Web-Scale Discovery Services
- Library Apps, Mobile based Library Services and Tools
- Application of Artificial Intelligence
- Application of Expert System
- Assistive/Disruptive Technologies
- Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), Extended Reality (ER)

Apart from above a rigorous and systematic course need to be taught with the existing structure of LIS curriculum. A detail framework/ module of the course is being proposed here in the next part of this article.

The propose module to be incorporated in LIS Curriculum -

To align with new Academic Bank of Credit system, library science and information science we can operate the courses in blended learning model of teaching. In order to deals with information and data the librarians must equipped with some programming skills. The journey of data processing and machine learning starts with the Python. Python is a versatile programming language, suitable for projects ranging from small scripts to



large systems. We need to be learn the application of python in text analysis for natural language processing which much helpful in library profession.

Course Name – Natural Language Processing for Librarian

The course will give theoretical and methodological introduction to a the most widely used and effective current techniques, strategies and toolkits for natural language processing and its application in library, with a primary focus on those available in the Python programming language.

Credits : The Couse will be for Six credits. The students have to earn the credits by attending the lectures, practical, assignments, projects and finally examination.

Semester : This course can be executed in two semesters in one academic year.

Prerequisites: This course is not intended for absolute beginners in programming, but includes review of elementary features. Students are expected to be able to open command prompt windo or terminal window, edit a text file, download and install software, and understand basic programming concepts.

Technology Requirements

It requires easy access to a computer with strong internet capabilities and a high-speed internet connection. For Online the students need headset (possibly with microphone) for use during live sessions. The programming can be done on Google CoLab.

The Modules of the Course – The course will be taught in Six modules. Every module will require 15 sessions of minimum two hours in four weeks.



Module- I Python :

General Introduction to Python and computer language. Using the command interpreter and development environment. - Introduction to git and GitHub, Basic data types, Functions: definition and use, arguments, block structure, scope, recursion. Modules and import, Conditionals and Boolean expressions.

Module – II Programming with Python :

Modes of Programming in Python, Interactive mode programming, Script mode programming, Creating Python program file, Python Identifiers, Python keywords, Lines and Indentation, Spilt Python statements, Join Python Statements, Writing code blocks, Comments in Python, and Quotation in Python. Sequences: Strings, Tuples, Lists, Iteration, looping and control flow. String methods and formatting.

Module- III Data and Database :

Organisations store their data using a combination of relational and non-relational databases. Software professionals and data scientists are expected to know how to access & query the database and to perform analyses on the extracted data. Linear & Non-Linear Data Structures, Trees & Tree Traversal, B-Trees, Node Relationships, Adding & Removing an Element Binary Tree & Binary Search Tree, Properties, Implementing Binary Trees, Operations. Introduction to Database, Brief Overview of Relationship, RDBMS, creating a Database Overview of Joints - Inner, Outer Joints, Aggregations, connect to Database using Python Executing SQL Demands, My SQL Workbench, List of Commands in SQL, Data Control Language, Transactional Control Language Types of NoSQL Database.



Module -IV Natural Language Processing Syntactic Analysis:

Introduction to how computers understand and translate human language, written or spoken text and perform tasks like translation, keyword extraction, topic classification, and more. Syntactic- **Tokenization** consists of breaking up a text into smaller parts called *tokens* (which can be sentences or words) to make text easier to handle. **Part of speech tagging (PoS tagging)** labels tokens as *verb, adverb, adjective, noun*, etc. This helps infer the meaning of a word (for example, the word "book" means different things if used as a verb or a noun). **Lemmatization & stemming** consist of reducing inflected words to their base form to make them easier to analyze. **Stop-word removal** removes frequently occuring words that don't add any semantic value, such as *I, they, have, like, yours*, etc.

Module -V Natural Language Processing Semantic Analysis:

Semantic analysis focuses on capturing the meaning of text. First, it studies the meaning of each individual word (lexical semantics). Then, it looks at the combination of words and what they mean in context. The main sub-tasks of semantic analysis are: **Word sense disambiguation** tries to identify in which sense a word is being used in a given context. **Relationship extraction** attempts to understand how entities (places, persons, organizations, etc) relate to each other in a text.

Module – VI Language Processing and Python (NLTK) :

NLTK (Natural Language Toolkit) Library is a suite that contains libraries and programs for statistical language processing. It is one of the most powerful NLP libraries, which contains packages to make machines understand human language and reply to it with an appropriate response. This module include- Download & Install NLTK, NLTK Tokenize: Words



and Sentences Tokenizer with Example, POS Tagging with NLTK and Chunking in NLP, Stemming and Lemmatization with Python NLTK, WordNet with NLTK: Finding Synonyms for words in Python, Word Embedding Tutorial: word2vec using Gensim, Seq2seq (Sequence to Sequence) Model with PyTorch.

Learning Outcome of this Programme :

This course will help students/librarians to understand how their users perceive them across all channels of communication, whether emails, product reviews, social media posts, surveys, and more. Not only can NLP tools be used to understand online conversations and how user search their information, they can also be used to automate repetitive and time-consuming tasks, increase efficiency, and enable librarians to focus on more fulfilling tasks. Here are some of the main outcome of this programme.

1. Language Translation

Machine translation technology has seen great improvement over the past few years. Translation tools enable librarian to access and use of information in different languages. It will help to understand specific terminology in any given subject

2. Text Extraction

Text extraction enables to pull out pre-defined information from text. It helpd to deal with large amounts of data, this tool helps you recognize and extract relevant keywords and features (like process, conclusion, findings, colors, and specs), and named entities (like names of people, locations, subject names, emails, etc). Librarian can use text extraction to automatically find key terms in text, identify the main words mentioned in text, or pull out the specifications from a paragraph of text, among many other applications



3. Chatbots -

Librarian can extend their expert assistance to their users with chatbots. Chatbots are AI systems designed to interact with humans through text or speech. The ability to offer 24/7 assistance (speeding up response times), handle multiple queries simultaneously, and free up human agents from answering repetitive questions.

4. Topic Classification-

This enable librarians to organize structure and unstructured text, data, and information into logical categories. The use of topic classification to automate the process of tagging incoming support tickets and automatically route them to the right person.

Challenges in the implementation of the Course-

The adaptation of any new change or modification in existing system is always a challenging. Especially, the course to be adopted if it is technological driven and require specialize expertise becomes more challenging. The execution of the proposed course is fraught with some most basic problems which also need to be addressed properly. Some basic challenges are as follow-

1. Lack of skilled and duly trained manpower.
2. Lack of necessary infrastructure such as computer lab, Internet Connectivity, some software etc.
3. Non-Technical background of the LIS Students.4. Lack of reading materials etc.



Although, NEP-2020 itself offered the solution to overcome the such problem i.e. blended learning and online teaching with self-paced mode.

Conclusion:

LIS profession has undergone in paradigm shifts due to technological changes. LIS programmes, their curricula content, and delivery modes should be, on an ongoing basis, reflected on by the faculty and revised where necessary, taking into account input (formal or informal) from faculty members, students, employers and national professional bodies. Such a continuous approach to review and innovation is necessary to ensure that LIS programmes reflect changes in LIS professional practice and related LIS education, nationally, locally as well as internationally. As the LIS education in India is being completing 112 years in 2022 there is need to revamp and restructure the LIS curriculum in present era in view of National Education Policy. All LIS departments and professional associations across the country should come together to bring the uniform standardization in the LIS education according to the present needs and in view of National Education Policy. There is need to revised a Model Curriculum 2001 in accordance with NEP 2020 so that uniformity can be maintained in LIS curriculum at National Level.

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