STATISTICAL ANALYSIS OF DIGITAL LEARNING RESOURCES AND STUDENTS PERFORMANCE USING CONTROL CHARTS

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ABSTRACT : Education is an investment in human capital. We all are aware that, in recent year's technology changing the face of education. Now a day Digital Learning Resources (DLR) plays an important role due to pandemic. It engages the students in learning concept and supports to achieve their goals. In this study, the article describes the Students performance in Digital Learning Resources by-Comparative analysis of Education techniques now and then-Students mind set towards DLR and knowledge-Teachers role and perception in importing education through conventional and DLR mode. Analysis is based on collecting date from respondents through online survey and using statistical control Charts.

Key Words: DLR, SQC, Education Transition, Teacher Educators, Students Erudition.

Introduction

Education is a powerful driver for country development and gaining knowledge from tools or someone else. Education is custom denoted by teacher-student bond. At beginning, Gurukulam was the Education system around third century B.C. This system was teacher centric education where sages and scholars import the knowledge verbally. They were taught Vedas, Upanishads, Dharma sutra and Brahmanas. The students of Gurukulam were requiring doing their daily chores on their own resulting in an independent temperament and helping them gain skills needed for sustenance. The core of this education system lies in the principles of discipline and hard work. It leads a good quality in people to learn required skill for their life development. In second generation, after British invaded India, the education system was drastically changed. They made the syllabus limited to some extent and created an examination system which mostly focused to pass the subject rather than learning by heart. The quality of education was almost staggered, where teacher could teach certain skills to children and they were able to use these skills for the rest of their lives. Comes to 21st century, current period the education system was fully controlling by the Government. To impart education to such a vast population having demographic variation is a demanding task. Determined to do the work at hand the Government of India along with the state Government has formed many independent governing bodies for regulating the education system at all levels from pre-primary to higher education. The Governing bodies include CBSE, NCERT, NAAC, AICTE, and UGC to maintain the standards of education besides release of grants [7]. As technology is increasing day by day, with the NCF and recent policies on digitalization in education has transformed over centuries basis the social sifts and economical and technology discoveries. The Indian government launched the „Digital India" in July 2015, means providing Digital Learning Resources (DLR) which is the materials that have been created digitally. Otherwise we say digital library that provides various application (app), programs, websites to collect the wanted information to strengthen online infrastructure. "Digital India is more for the poor and under privileged. It aims to bridge the gap between the digital haves and have-nots technology for citizen" [2]. Digitalization of education is rapidly developing during this pandemic state, way of teaching the student's turns to massive open online course (MOOC) [6]. Especially blended system started to provide better approach of understanding the

concept, leads to separate teachers and student bond. Digital Learning Resources were briefly used by students to access to what they do better aside textbooks. The use of digital learning resources in the implementation of individual itinerary of students has been increasing. This article briefs about an analysis of DLR and students performance using control charts and also includes SWOT Analysis on impact of Digital Learning Resources.

Research Methodology

The survey was conducted in the form of questionnaire through digital platform. Created a set questions related to the topic in Google form and the URL of the form shared to the students. This study contains both qualitative and quantitative process to analyze student performance in using Digital Learning Resources. The quantitative methodology used to analyze student performance. The survey contained student's perception on Digital learning Resources comprised thirteen questions about how the students perceived their own academic abilities and knowledge of DLR. The quantitative data was analyzed using SPSS software. The qualitative methodology was used to obtain extra information about student mind set towards Digital Learning Resources.

Concept of SQC

Statistical Quality Control (SQC) is the term used to describe the set of statistical tools used to analyze the quality problems and solve them. It should be implemented through Control Charts that are used to monitor the output of the process and measure the problems. There are 2 types, Variable and Attribute control charts. A Control charts consists a centre line, the average of the samples. Two control limits used to find whether action is required, an Upper Control Limit (UCL) and a Lower Control Limit (LCL). A control chart has control limits set at values such if the process is in control, nearly all points will lies within the Upper Control Limit (UCL) and the Lower Control Limit (LCL)is set three-sigma levels above and below respectively. If it has rule violation in control chart, fewer than 8 control chart rules indicate that there are special causes of variation present or the things are out of control.

Results and Interpretation

Student involvement and knowledge on Digital learning resources are the major change of Educational system in present days. Students learning skill and interest vary from now and then. Then education method was memorizing, reinforcement, Debates, Test, Read. At past we were physically present and mentally listens our subject in the class rooms. Now that has suddenly changed to the advanced Digital Learning resources in a very short span of time due to unavoidable circumference. This could cause some pros and cons on student development in their academic state and health state. Since DLR is being used by student for their academic purpose. It impact should be under control to proceed cooperatively with DLR. Based on the data, a Stewart's control chart was constructed shown in Fig.3.1. The output of the chart is the impact of Digital Learning Resources in learning. The centre line is the average value of the result. The UCL and LCL were defined as the average value of the result $\pm3\sigma$ respectively, where σ is the standard deviation. The average result is 3.50, UCL is equal to 5.40; LCL is 1.60. The result shows it has rule violation, so we consider from the result as out of control since it has rule violation of control chart.
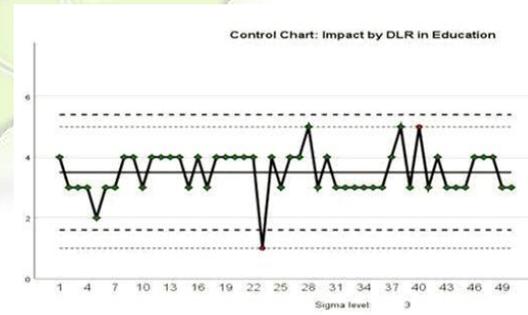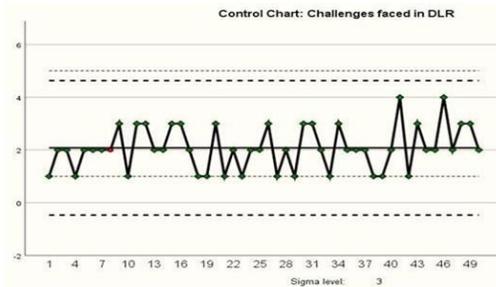

Fig 3.1: Control chart on impact of DLR

The successfully implementation of Digital learning depends on how the resources is performed by students. There are various Digital learning tailspins such as interaction with peer students, video-audio setting knowledge and so on. Student facing a lot of challenges on Digital learning which could positively encourage, negatively affect them. Fig. 3.2 shows the chart of Challenges facing by student in Digital Learning resources, the condition were applied as above. The UCL is
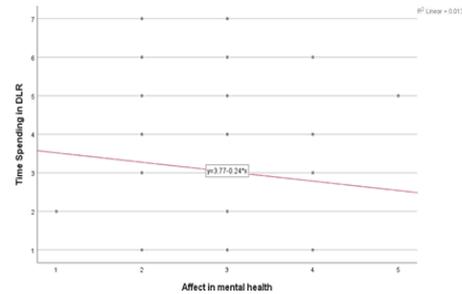
4.63; LCL is -0.47, the average is equal to 2.08. Since consecutive points on control limit we consider challenges in DLR facing by students is out of control.

Fig 3.3 Correlation between Time spending in DLR and affect of Physical health

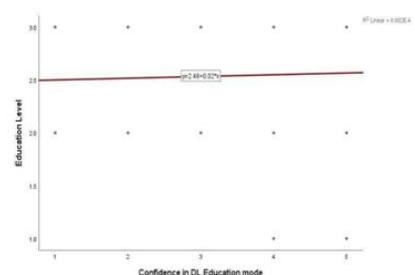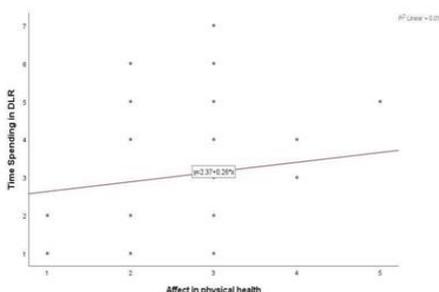**Fig 3.2: Control chart of Challenges faced in DLR**

Well, probably there is biggest challenges facing by students even by teachers on DLR. Due to this COVID-19 pandemic, the classes are conducted through online mode which consist Digital software to attend it. Ensuring Digital equity is crucial in this tough time. Not all the students and teachers have access to all digital devices. So on basically we need setting up infrastructure on devices but it is not available to all students, students and teachers are suffer learn to use new tools, most importantly who is not well in operating Digital learning resources may engage with cyber-bullying. These are challenges in Digital Learning Resources which also cause challenges on student mental and physical health. A lot of time and cost is involved in Digital Learning Resources. It starts from downloading the software or apps to understanding its whole features. Time spending on Digital Learning Resources leads to health issues, so there is no use of achieving in academics after affecting health. In Fig 3.3, shows a correlation between time spending time in DLR and Physical health.

Fig 3.4 Correlation between Time spending in DLR and affect of mental health

The correlation in the main diagonal is of time spending and impact of physical health equal to 1. Since the sign of the correlation coefficients indicates the positive direction, it is perfectly positive linear relationship. Thus students getting affected more physically as more usage of DLR. Fig. 3.4 shows negative correlation, (i.e.) students get less stress when spending their time in DLR. They able to search books using e-books in DLRs. On spending in DLR for their study purpose or own purpose that turns to found to be that they were not sufficiently prepared for balancing their work, family, personal life. Depending on students capacity the time spending is differ from each student. Still the government doesn't give clear stipulation in educational policies about Digital Learning Resources. There is lack of standards for quality control, development of Digital resources and content. Due to the happening of this crisis, the children were literally forgotten to learn than adults. From Fig 3.5 we ensure the confidence level of students using digital learning resources with their education level.
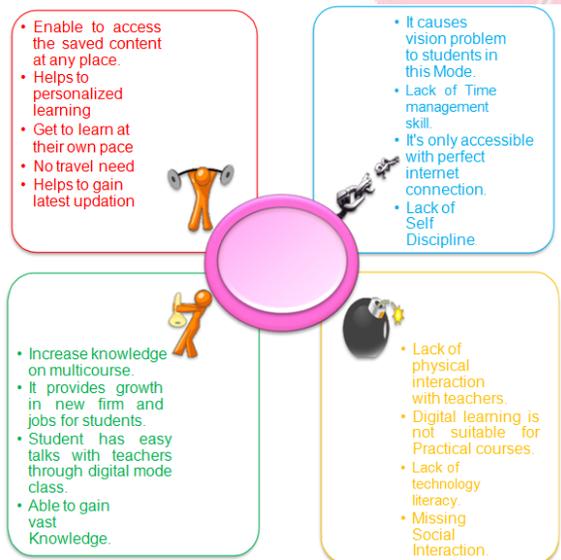
Fig 3.5 Confidence level of students using digital learning resources with their education level.

The scatter dot graph shows slightly strong positive correlation, r=1. Thus we say that there is a lack of confidence in school level student than graduate. The youth can able to make it fast on DLR how to use the apps and so but children were struggling to get to it. The more complex is if their parents are illiterate means it really tough for them to overcome from difficulties in digital resources. These problems finally hit hard on their academic performance. And also this would probably lead a bad future. Now we say the graduate students also staggering on their confidence level when comes to academic courses but they really well defined with other extra-curricular courses in Digital resources.

SWOT ANALYSIS

Since Digital Learning Resources have been using throughout the world, many academic Institutions, Schools and Universities providing various resources like Google Hangouts, Zoom, Microsoft teams, etc., to the students. Here are Strength, Weakness, Opportunity, and Threat of DLR on students to perform in their academic.

- Enable to access the saved content at any place.
- Helps to personalized learning
- Get to learn at their own pace
- No travel need
- Helps to gain latest updation

- It causes vision problem to students in this Mode.
- Lack of Time management skill.
- It's only accessible with perfect internet connection.
- Lack of Self Discipline.

- Increase knowledge on multicourse.
- It provides growth in new firm and jobs for students.
- Student has easy talks with teachers through digital mode class.
- Able to gain vast Knowledge.

- Lack of physical interaction with teachers.
- Digital learning is not suitable for Practical courses.
- Lack of technology literacy.
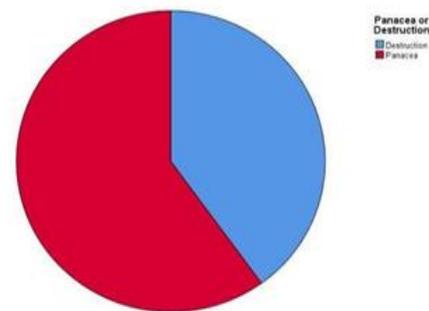- Missing Social Interaction.

Fig 4.1. The SWOT Analysis of Digital Learning Resources for students.

Discussion:

Digital Learning is a lack of interaction among student and teacher and most important a way how student studied together as like as early days. Long duration of using Digital resources can cause eye related problems as we seen student those who had not preferred to wear prescribed glass are now wearing contact lens, this is obviously big impact of Digital Resources since they have no choice to learn through instead of not studying. Student even went across depression because of generating DLR. However, we have huge course in education. Student getting benefited likewise, MBBS students can enable to learn the courses by animation video, Law students can able to get points from simply searching the tools and Arts student getting special benefit to develop their skill using Digital resources. In digital age, teachers have a variety of tools and resources to create models, games, e-notes etc. for students" better understanding. Teacher role during this situation is zigzag. They want student to get the concept but supposed to teach through Digital Resources such as G meet, Zoom there is no idea if the student are carefully listening or not even though they are in the class. Our survey revealed most of students favored Digital Learning Resources to sustain their academic performance during this pandemic.

Survey Question: Fast moving towards Digital Learning is a Panacea or Destruction?

Out of fifty responses 65 percentage of students spent their time in Digital learning resources as panacea. So we say rapid moving to Digital learning has been fitting to the students.

Fig 4.2 Results on Digital Learning is a Panacea or Destruction

Conclusion

The findings of this study is student have experienced both difficulties and success using Digital Learning Resources. It is drastic change which students and teachers not quickly cope up with but they supposed to engage. Digital Learning has so much of time and flexibility. During such touch time, Digital Learning Resources gives also some relaxation to overcome from the barriers by helping as e-book. Technology provides great innovation, worldwide information and creation among student in the form of Digital Learning Resources to achieve widely. They have plenty of opportunities for the student to play in different area in education. In this crisis, we have no other alternative left other than adapting to the dynamic situation and accepting the change. Also we cannot ignore the student who poorly participating through Digital Learning Resources. Since we couldn't predict what would happen at future nor blame other, we have to be ready to adapt with Digital Resources to tune ourselves. Students are pillar of the country, so government has to make strong decision in education policy when it comes to Digital Learning. We are moving to Digital world so it is necessary for us to be good at technology way of study. It all should be positive when all students know their responsibility and catch the awareness of Digital Learning Resources" use. From our survey, statistically we able to understand student performance using Digital Learning Resources is almost Neutral because some students already made their self to adapt, some are still trying to adapt.

REFERENCES:

[1]   Amin ShakaAunali and D. Venkatesan (Apr. 2019), "Recent Developments in Control Charts Techniques", Vol. 8, Issue 4,ISSN NO: 2277-2723.

[2]   Bidisha Borah, "Digital India: Challenge & prospects", European Journal of Molecular & Clinical Medicine, Vol. 7, Issue 3, 2020, ISSN 2515-8260.

[3]   Digital Learning Day 2021: Digital Learning Resources Roundup, available in https://www.rev.com/blog/

[4]   Dr.ShwetaSmrita Soy (March 2021) A Revolutionary Step Towards Digital India Vision of NEP 2020. Volume 8, Issue 3, ISSN-2349-5162.

[5]   Education Organisation available in https://targetstudy.com/organisations/

[6]   Mangesh M. Ghonge, Rohit Bag and Aniket Singh(Oct. 27th 2020). "Indian Education:

[7]   Ancient, Medieval and Modern", Education at the Intersection of Globalization and Technology. E-book ISBN 978-1-83962-471-1.

[8]   L.K. Monu (Nov. 22, 2021), "The Gurukul System of Education-India"s Tradition-India"s Pride".

[9]   NajmulHasan and YukunBao (August 12, 2020), "Impact of "e-Learning crack-up" perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss".

[10]   ShivangiDhawan (June 20, 2020)."Online Learning: A Panacea in the Time of COVID-19 Crisis". Journal of Education Technology Systems.