Volatility of Digital Technology Enabled Learning through Social Media: Educators' Apprehensions

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Abstract:

The volatile digital strategies transform the whole world in tune with the challenges of the industry 4.0 supported by web 3.0 and Artificial Intelligence. Along with the volatile and rather ambiguous intelligent business advancements, considerable technology modification is envisaged in education sector also. The educators needed to be equipped with strategies and expertise in educational technologies to address the demands of 'digital native' learners. Efficient use of Digital Learning Environments in academic setting requires an edge in solving many important techno-social apprehensions mutually. This descriptive research study was aimed to identify the educator's apprehensions and ambiguities on the use of IT through social media. The Higher Secondary School teachers were taken as the study population with a respondent sample of 564 in a stratified cluster sampling model. Discussions and feedback survey were used to gather data. This study revealed that strategies and preferences of digital resources varies considerably between teachers and students. Teachers prefer to adhere to less advanced or established systems where students prefer the budding technologies in collaborative model. The effectiveness of social media in education was rather ambiguous in nature. Teachers perceived that students' social media use is to be moderated as it accelerates alienation from realities, provides shallow learning and cyberloafing. Result of this study may helpful to remodel the technology inclusion strategies in curriculum and teacher's technology training also. Further elaborate researches may warrant in this regard.

Keywords: *Social media, Digital Learning Environments, Technology adoption*

I. INTRODUCTION

The digital technologies are consequential in the rapid transformation in every field of modern world, fueling the exponential growth through the radical paradigm shifts in tune with the knowledge explosion [1]. The rapid advent of a plethora of new technologies in all fields of social existence demands an accelerated learning and proficiency in creating high performing work-systems[2].The introduction of Industry 4.0 remodels the overall ecosystem of the industry and ardently demanded 'neoskilling strategies' for reaping the fruits of digital transformation as it became the indispensable part of every one's daily lives [3]-[5]. Volatility and uncertainties of technological advancements brings lot of ambiguity in traditional industry and in educational scenario.The industry and products are redefined in tune with the flux of the technological changes. The world became so volatile as the great Greek philosopher

Heraclitus denoted, 'You can't step twice into the same river' of technology today. Virtual communities and social networking sites (SNSs) became the critical platform for social changes and information sharing among the millennium generations [6].

In harmony with the advances of the ever-volatile technologies, the traditional mode of education also remodeled to incorporate it in teaching learning process [7].In par with the Industry4.0, the traditional learning process also re-nomenclature as 'Education4.0' [8]. The Millennial and Post-Millenniallearners are often denoted as the 'Digital Natives' who spontaneously spoke the native digital language and the teachers were often termed as the 'Digital Immigrants' who acquired such technological language at a later point in life [9], [10]. Thus, bridging the existing digital divide between the learners and educators became a critical concern for the education policy formulators of Education4.0 era, as these 'digital immigrant'

teachers were educating the digital native students, so they have to be trained to adopt technology in teaching [3], [11]-[13]. Many studies were done on sustainable technology adoption process in education and modifications were brought to the teachers' technology training programs. This descriptive study was designed to identify the teachers' apprehensions on students' learning with respect to the volatile Digital Learning Environments (DLEs) and social media. It also aimed to bring forth sustainable strategies for teacher trainings and technology implementation.

II. DIGITAL TECHNOLOGY ENABLED LEARNING

The impact of the digital technology in creating the Higher Order Thinking Skills (HOTS) and innovation depend on teachers' expertise in technology and ICT skills [10], [14]. Even though the technology acceptance level across the generations are different, the teaching learning process has to change from traditional models to technology enabled collaborative models [15],[16]. Studies based on the Technology Acceptance Model (TAM) of Fred D. Davis (1996), unified theory of acceptance and use of technology (UTAUT) of V. Venkatesh (2010) and Technological pedagogical content knowledge (TPACK) of Punya Mishra and Matthew J. Koehler (2006) had brought to light that effective technology adoption of the teachers were a sluggish process but could achieve momentum with support of multiple stake holders as school environment, management, peers, students and administrative systems [17]-[25]. DLEs and digital pedagogical strategies were established in education system to scaffold the ease of knowledge transmission. Corporate entities and education policy makers jointly toiling for a technology grounded education system to form the future generation to suit the demands of the intelligent work space of Industry4.0 [26]-[28].

Education sector is rather immune to the changes and retardation to technology adoption is evident in teaching-learning process. It is manifested through teachers' inclinations to use the traditional pedagogical tools than the technology enriched innovative models [29]-[31]. High expectation on the teachers' technology enabled performance inflicted a 'technostress and technology induced anxiety' in them and many were found difficult in mediating with the demands of these digital learning environment (DLE) of the modern education system [9], [10], [20], [32]. This is because the technology readiness of the teacher community is less than that of the learners due to their generation difference [33].Many educators were really skeptic about learning impact of DLEs especially when intertwingled with social media platforms. As per the technology readiness index (TRI) studies, majority of the teacher population exhibited a 'digital immigrant' trend as categorized as technology sceptic or technology avoider, who were hesitant to adopt the technology in the earlier adoption periods [34], [35].

The cognitive and social interactive nature of the teaching profession naturally follows socio -cognitive learning process than coercive directives. Studies based on the Social Cognitive Learning Theory of Albert Bandura (1986) brought to light that the teachers adopt the learning technology better with the support of the peers and student support groups. Socio-cognitive perception and integration of social media for learning purpose, greatly reduces teachers' inhibition to use the digital resources and technology infrastructure provided in education system[36]-[38]. A real-time understanding on the teachers' apprehensions on the use of DLEs and perceptions on the students' technology-based learning will be effective in mediating the digital chasm between them and to formulate sustainable strategies to intercede with expectations of the industry.

III. IMPACT OF DIGITAL LEARNING ENVIRONMENTS ON STUDENT'S LEARNING

The digital learning environments (DLEs) became integral to the sustainable learning strategies of the modern education ecosystem system. DLEs consisted of smart classes, personal gadgets, digital library and curriculum-based e-resources, simulated labs, academic management or ERP systems. Even virtual reality classes and student specific intelligent learning systems are envisaged as the part of Education4.0 era. DLEs were insisted extensively in modern teaching-learning process even from the lower classes to the research levels to reap the benefits of the 'connectivist trends' of the digital citizens [16], [38]-[40]. Studies had denoted that students were expressly sensitive to social media and smart-gadgets because of their pervasiveness and virtual connectedness [41]-[44]. The social media platforms and the smart-gadgets are the inseparable part of the student's life and they are even considered as the integral part of the sustainable social-learning process.

The Education4.0 environments supported with web3.0 were redefined the traditional learning process with respect to the virtual integration of multiple gadgets with intelligent cloud services which is deemed as the social learning environment for the Net-Gen learners [8], [25], [45],[46], So, the present-day social learning environments are tending to be delinked from the physical classrooms and getting closely knit together with the cloud services of social media or DLEs to ensure mobility to tech-savvy learners across the IT infrastructures of schools and other personal learning environments [25], [47]-[49]. The studies on social media, based on connectivism, social exchange theory, social penetration theory and cross-cultural theory of individualism–collectivism had concluded that the self-disclosure, trust in resource sharing and collective learning of online communities were increased among the social media users [38], [50], [51].

The academic benefit of these DLEs and social media when evaluated through the glasses of traditional learning outcome may be considered as meagre, however the collaborative, creative and spontaneous nature of the learning outcomes are well cherished through these

platforms. The memorization and reproduction model of the traditional education system is not much cherished through these DLEs, instead, learning is esteemed as collaborative, responsive and creative in nature [13], [18],[27],[52].This paradigm shift from memorization-reproduction model to HOTs was catalyzed by ubiquitous data connectivity [53]. Traditional mode of evaluation about the effectiveness of the DLEs and social media learning is to be reinterpreted with this backdrop.

A balanced view about the use of modern learning technology is needed to bridge the digital divide between educators and learners. Studies based on the traditional educational outcome models shown a negative correlation between social media use and academic performance. Educators observed the excessive stress on DLEs and social media use (SMU) could lead students to screen and Game addictedness, deviate them from proper time management, 'cyberloafing', getting alienated from the real friendship circles, health issues and psychological disorders [21], [41], [51], [54]-[56].Based on the different theories of technology adoption with cognitive-social learning backdrops, many studies were conducted on SMU in education and its impact on effective learning. However, studies on use of social media and its role in the learning process is a never exhaustive research area, as the social media and digital learning platforms are influx with unprecedented features of interaction and sharing, added customization and inter-communicability between networked apps, innovative user experience, thematic designs and even incorporates the intelligent features of web3.0 to address the individualized demands [57]-[59].

The digital citizenship and its learning demand are different from the traditional models. The divide between the traditional educators and millennium learners needed to be minimalized through the mutual understanding and regular collaboration. Thus, the scope of sustainable education strategies to tap the benefits of ever-emerging intelligent technology are in exponential model. A continuous-real-time educational research is needed to feedback and tap the advantages of this transformational technology process. This descriptive study was thus designed to identify the teachers' apprehensions on students' learning with respect to the volatile DLEs and social media and it also aimed to understand their social media usage.

IV. RESEARCH METHODOLOGY

This descriptive study was aimed to address: how the higher secondary school teachers view on the use of DLEs at schools for the teaching purpose? How the use of social media is different from those of the student? How teachers evaluate the students' use of social media in supporting their academic learning?
- Based on the above research queries, it was aimed:
- To study the perception of the higher secondary school teachers on the Digital learning environments established in the schools.

- To study the teachers' preference of social media platforms with respect to the students.
- To study teachers' apprehensions on the use of social media by the students with respect to academic learning.

This study was conducted among the teachers of Higher Secondary Schools (HSS) of Kerala, India to learn their perception about the students learning using DLEs provided at the schools and at their homes with respect to social media use. Stratified cluster sampling was used to collect the data for this study from Kannur, Thalassery and Wayanad revenue districts of Kerala. The HSS sector in Kerala were categorized as 1) Government HSS 2) Government aided HSS, 3) Unaided HSS, 4)Center Syllabus HSS. The population size was 6850 and 564 samples were available for analysis with 95% confidence level, 5% Margin of error. Data for social media use of students were collected from 280 students. Data were coded, analyzed and secured to protect as per the research code of ethics.

Teachers responses were collected through open-ended questions adapted from the respective literature after the detailed review of literature and field study. Language of the tools was tested with concerned experts and incorporated their insights to the tool. Pilot testing with 122 samples were conducted to access the validity and reliability of the tools. The open-ended responses were recorded with the survey form administered by the researcher at the learning premises of the respondents. Detailed discussions were made, whenever possible with educators, IT resource persons and with managers/administrators of the HSS to get a primary understanding on the impact and usage of the digital learning environment.

V. RESULTS

Among the 590 responses collected, only 564 responses of teachers were complete and were used for this study. Sample was with 66.3% (374 teachers) females, 45.4% (256 teachers) were aged between 40-50years, 45.2% (255 teachers) were with below 10years of teaching experience. They were specialized in disciplines of science, arts, commerce or languages and 480 teachers(85.1%) were Post Graduate degree holders with B.Ed. qualification. In addition to the technology use at schools, 97.7% (551)of teachers were daily using internet at home and 74.5% (420) teachers were spending more than 30 minutes and few of them spent more than 120 minutes a day with mobile and/or personal computers for communication and class preparations. There is meager negative correlation between internet usage at home with respect to experience groups (Pearson correlation, r= -0.102, p= .015) and age groups (Pearson correlation, r= -0.145, p= .021). It confirmed that affinity to technology adoption was different across the age groups [34]. Teachers gender, school sector and subject specialization had no significant relation with their internet and social media usage.

A. Perception of the Higher Secondary School Teachers on the Digital Learning Environments

The teachers' over all perception related to the digital learning environments were concentrated around following concerns

- DLE supported pedagogy is adopted in education. Even though many teachers (362 teachers, 64.2%) expressed that they were not fully able to use the technology features in their class rooms and labs, still they believed that DLE can't be avoided from school curriculum.
- Technology enabled learning and class preparations were consuming more time than the traditional pedagogy models. Time frame for completing the syllabus was insufficient and readymade materials were not available for non-science subjects. Students were more interested in animated and visual descriptive model of teaching than the chalk and board.
- Anticipated technology failure during the lecture, created anxiety in them and the natural flow of teaching process feared to be interrupted. Teachers aged above 40 expressed the intricacy of the systems and its connectivity issues. Data connectivity and projecting issues were concerns of DLE curriculum.
- Technology trainings were beneficial for 89.2% (503) and needed to be provided in age groups; the time taken to understand and practice were different. Peer learning and technology facilitating student groups as 'Little KITES' were very helpful for 86.7% (489) in using technology in class rooms.
- Management support and appraisal will enhance the use of DLE. Students were demanding the extended use of technology for learning. However, 23.4% of teachers (132) strongly expressed that the overstress in DLE based teaching will undermine the theoretical depth by promoting shallow learning styles in schools.

B. The Teachers' Preference of Social Media Platforms with Respect to Students'

It is clear from the Table-1 and Table-2(Appendix), that student's preference of social media usage was different from that of the teachers. Students reported that they were adopting social media apps as per the trends of the time and the friends' circles preference affect them in using it. 'Smule' was their trend a year back but now it is 'tick-tok'. Students preferred games and social media whenever they were tired or need refreshing. 86.9% of teachers (490) reported that they use the media with definite purpose. The generation shift is vivid from the table provided below. It is noteworthy that mobile calls and SMS were the earlier mode of contact but is getting less frequent in use now. Combined learning and study material sharing were frequently done through social media platforms by the students. The teachers range of social media is very limited while the students have wide range of social media for different purposes. Teachers prefer to have direct physical communication whenever possible, while students prefer media supported chats, even when the respondent is nearby.

C. Teachers' Apprehensions on the Use of Social Media by the Students with Respect to Academic Learning

Based on the responses on the teachers' perception on student's social media use the following concerns were formulated after analysis.

- Delinking tendency from the facts and real-world issues
- Teachers were a little anxious of the impact of the social media fearing that students were in the Platonic world of shadows, and not in reality. Fact checking and retrospective analysis was getting reduced when accessed through social media. Social sensitivity among them was limited to just commenting and sharing in social media. Social injustices were extensively attacked and values were defended among students in terms of virtual support propaganda. The social media challenges were carried out just to became the hero in their peer groups, personal values were not reflected in social media. Introspective learning and critical thinking were getting reduced
- Interpersonal/social relationship is getting limited and personal freedom/space concept was getting more acceptances
- Lasting interpersonal relationships among students were getting reduced and need based peer teams were formed among the students. Personal freedom was getting high importance as possession of gadgets, social media personality and reach are getting more prominence than real friends circles. It was strongly opinioned (90.1%) that parents and teachers were getting eliminated as the influential figures. Sharing personal items especially with parents was not the trend among them.
- Alienation from the nearby and inclined to the global issues
- This is noted as the result of over emphasis on the technology. Technology usage cast an image that the world is nearing to their gadget and need not toil for it in real world. (teachers noted the troll: In 1990s parents snatch students from play grounds to home; in 2019 parents push the students from rooms to play ground)
- Screen addiction: specially for Gaming and social media presence
- Teachers (87%) were anxious about the screen addiction among the students. Gaming starting with curiosity/peer influence and many were deviating from academic performance due to the addiction to certain games as Ludo King, Candy Crush, PUBG. Number of social media 'likes, comments, followers' were a major point of anxiety among students' community.

- Increased affinity for social learning and peer groups, Personal Learning Environments were preferred
- Teachers were agreeing that increased social learning could be taped from the students with technology usage. The collaborative learning was more effective, when properly guided. WhatsApp groups, Instagram, google class and similar platforms worked effectively in fostering learning. But many teachers felt difficult to be proper menders in this regard. Students preferred to be learned from peers using digitalized models. Search tool was more preferred than the word of mouth clarification from the teacher.
- Concentrated heavily on visual images, reduced visualization and deep learning capacity.
- The learning modality of the student were getting shifted from reflective to visual models. Critical analytics and deep learning were getting reduced, they pretend to study- cyberloafing with social media. Activity model and depictions are highlighted. The creativity among students were multiplied in terms of visual creativity.

VI. CONCLUSION

Even though education system is rather immune to technology adoption [60],teachers were convinced on the benefits of the DLEs and the monitored social media usage of the students for the learning purpose. Teachers were supportive of incorporating DLEs of the school curriculum with a little strain through official trainings and informal channels through peers and 'student IT support groups' of the schools.

It was confirming to the earlier studies that social media usage preference was different among teachers and students; teachers prefer to adhere to less strategic or more established systems where students prefer the budding technologies in collaborative model [61].Students could easily shift to popular ones as per the peer trends which resembled them as pioneers or innovators of technology and the teachers' adoption of social media technology was staggered as skeptic or avoider [35].

Students' use of social media for academic purpose was not satisfactorily perceived as beneficial by the teachers. They considered it as a more deviating than unifying student's leaning process, as most often, it alienated them from analytical and critical understanding with shallow learning of the core concepts. Perception of Teachers and students about the social media and DLEs were rarely converging, thus teacher trainings needed to confront these perceptional disparities. However, teachers agreed that sustainable digital strategies needed to be incorporated in educational sector to bridge the pitfalls of present systems. As the social media and associated technologies are in constant flux, this research prompt further study on teachers' approaches towards the students' social media usage to benefit from modern technology platforms. More research studies on sustainable learning strategies is warranted through mediation of DLEs, ever emerging social media and gamification platforms, enhanced technology adoption through students supported systems, personal and social learning with virtual gadgets, intelligent learning incorporation.

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Appendix

Table-1 Students' preference of social media with respect to their usage

Very frequent (More than 3 times in a day)	Regular usage (Daily less than 3 times)	Need based use (Whenever needed)	Rarely used (Once in a week or less)
Instagram, Games WhatsApp	FB Messenger, Face book, Share chat	Conference call, Smule, Google plus	News and media apps
Video & media Sharing	Mobile call, Video call, Sharing Apps	Learning apps, Moodle, duo	Blog/ others, Online TV steaming
Search (Google) for solution, info. Tik-tok,	Power Point, Word/Excel, YouTube, pods, Sports	Google Map, e-commerce apps, Ticket booking, e-Purchase, Pinterest	Linked-In, Skype, Hike, Internet -Mobile banking apps, PayTM,
Troll apps, editing apps	e-mail, digital scanners,	Learning Apps from agencies, Newshunt	Quora, Viber, Tumblr, The Dots
Snapchat, Telegram	Photo apps, GPay,	WeChat, Share chat, SMS, Twitter, Flickr	Hi5, Reddit, Foursquare, MeetUp,

Table-2 Teachers' preference of social media with respect to their usage

Very frequent (More than 3 times in a day)	Regular usage (Daily less than 3 times)	Need based use (Whenever needed)	Rarely used (Once in a week or less)
WhatsApp	Face book, SMS	Internet Banking/ Mobile banking apps	Conference call
Mobile call	FB Messenger	Google Map	Blog/ others
Search (Google)	e-mail	Share chat, Video sharing, google class	Telegram, Games
YouTube	Power Point, Word/Excel	Video call, Skype, duo etc	Linked-In, Flickr, pods
Teaching apps and sites	Teaching aids from agencies	Telegram, e-commerce apps, tickets	Tik-tok, Snapchat