TEACHING AND LEARNING PROCESS IN THE GLOBAL COVID-19 PANDAMIC

Edited by
Prof. N. Lakshmi
And
Dr. Ratan Chavan (Rabhyeo

Department of Studies and Research in Education

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TEACHING AND LEARNING PROCESS IN THE GLOBAL COVID-19 PANDEMIC

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Abstract

The world is constantly changing and various domains are also influenced by the change. The pandemic has successfully forced global shutdown of several activities including educational activities and this has resulted in tremendous changes in educational platform.Educational institutions in India are currently based only on traditional methods of learning, they follow the traditional set up of face-to-face lectures in a classroom. The evolution of the digital learning platforms has a huge impact on the educational institutions however there are demands for both technology and traditional learning. Due to this pandemic the method of learning changed which improved the technology utilization. Digitalized education and easy access to the internet is transforming the approach to learning with the virtual classroom, advanced learning tools and free educational content.In volatile times when digital schooling is required, it is essential that your institution or organization is prepared to rely completely on technology. Therefore the alternative of no schooling online schooling has been an important tool to sustain skill development during quarantine closures.

1. Introduction:

Education is quintessentially the core of humanity and foundation of a prosperous society. The progression in digital methods for education was imminent even before the unpredictable onset of pandemic. However the pervasive consequently redesigned the systems of education rapidly and made realize the importance of education. Opportunities like blended learning in the educational sector have arranged to ensure a much more practical and convenient learning experience.

Education using modern interactive media is much better than the classical methods of education. The advantage of digital systems is the speed of information flow and the

ability to update them. With the help of various media, a diverse transfer of knowledge is enabled.

2. **Benefits of digital learning:**
   - The use of a system under and synchronized the simultaneous action on multiple senses with the help of educational content enables the development of various cognitive styles, and students are more interested in learning compared to other activities.
   - The presentation of the content is more interesting, pragmatic and contributes to the acquisition of knowledge in different situations.
   - Interactive multimedia systems enable the transfer of knowledge by simultaneously acting on multiple senses, thus speeding up the process of acquiring material
   - The adoption of concepts encourages the student's activity, and solving the problems offered by the program motivates the student to learn.

3. **Advantages of Online Learning:**

   1) **Efficiency**

   Online learning offers teachers an efficient way to deliver lessons to students. Online learning has a number of tools such as videos, PDFs, podcasts, and teachers can use all these tools as part of their lesson plans. By extending the lesson plan beyond traditional textbooks to include online resources, teachers are able to become more efficient educators.

   2) **Accessibility Of Time And Place**

   It allows students to attend classes from any location of their choice. It also allows schools to reach out to a more extensive network of students, instead of being restricted by geographical boundaries. Additionally, online lectures can be recorded, archived, and stored for future reference. This allows students to access the learning material at a time of their comfort.

   3) **Affordability**

   Another advantage of online learning is reduced financial costs. Online education is far more affordable as compared to physical learning. This is because online learning eliminates the cost points of student transportation, student meals, and most importantly, rent costs. Additionally, all the courses or study materials are available online, thus creating a paperless learning environment which is more affordable, while also being beneficial to the environment.

4) **Improved Student Attendance**

Since online classes can be taken from home or location of choice, there are fewer chances of students missing out on lessons.

5) **Suits A Variety Of Learning Styles**

Every student has a different learning journey and a different learning style. Some students are visual learners, while some students prefer to learn through audio. Similarly, some students thrive in the classroom, and other students are solo learners who get distracted by large groups.

4. **Disadvantages Of Online Learning:**

1) **Inability To Focus On Screens:**

For many students, one of the biggest challenges of online learning is the struggle with focusing on the screen for long periods of time. With online learning, there is also a greater chance for students to be easily distracted by social media or other sites. Therefore, it is imperative for the teachers to keep their online classes crisp, engaging, and interactive to help students stay focused on the lesson.

2) **Technology Issues:**

Another key challenge of online classes is internet connectivity. While internet penetration has grown in leaps and bounds over the past few years, in smaller cities and towns, a consistent connection with decent speed is a problem. Without a consistent internet connection for students or teachers, there can be a lack of continuity in learning for the child. This is detrimental to the education process.

3) **Sense Of Isolation:**

Students can learn a lot from being in the company of their peers. However, in an online class, there are minimal physical interactions between students and teachers. This often results in a sense of isolation for the students. In this situation, it is imperative that the school allow for other forms of communication between the students, peers, and teachers. This can include online messages, emails and video conferencing that will allow for face-to-face interaction and reduce the sense of isolation.

4) **Teacher Training:**

Online learning requires teachers to have a basic understanding of using digital forms of learning. However, this is not the case always. Very often, teachers have a very basic understanding of technology. Sometimes, they don't even have the necessary resources and tools to conduct online classes.

To combat this, it is important for schools to invest in training teachers with the latest technology updates so that they can conduct their online classes seamlessly.

5) Manage Screen Time:

Many parents are concerned about the health hazards of having their children spend so many hours staring at a screen. This increase in screen time is one of the biggest concerns and disadvantages of online learning. Sometimes students also develop bad posture and other physical problems due to staying hunched in front of a screen.

5. Conclusion:

The online learning system, with its range of options and resources, can be personalized in many ways. It is the best way to create a perfect learning environment suited to the needs of each student.

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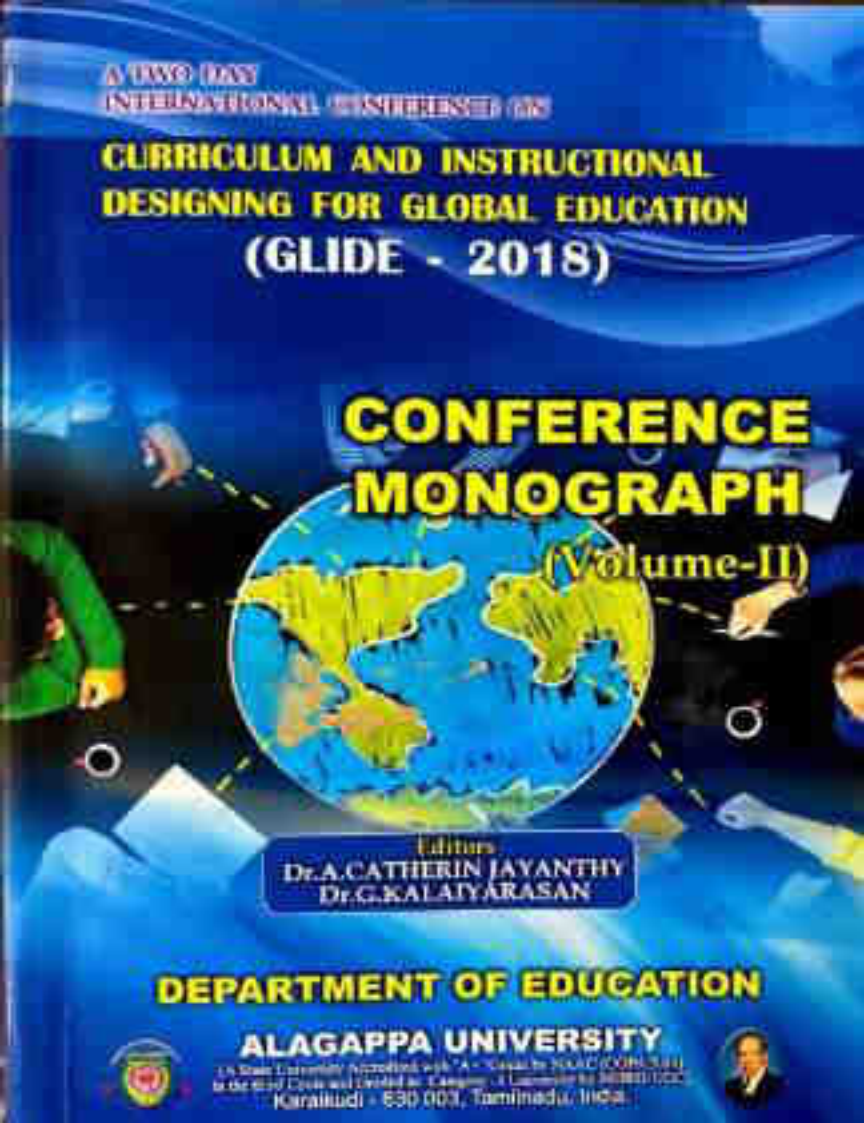

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IMPACT OF MOBILE TECHNOLOGY ON THE STUDENTS LEARNING SKILLS AND PERFORMANCE

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Introduction:

In the present digital world, Mobile technology is not helping the education system, even it plays important role in another sector. A few days in banking sector all the transaction can be done through mobile. Mobile Net banking facilities are adopted. In case of educational institution, the management uses the mobile technology for communication with parents to inform the student's attendance and performance. While it comes to the teaching and learning, mobile technology has greatly helped students and teachers by sharing the class room notes and accessing the online study materials. Over the past few years, there has been a surge investment in information and communication technology in the teaching/learning process. In this context, mobile technologies, including smart phones and tablets emerge as an innovative tool, more and with different methods and strategies.

Most modern classrooms are now connected to the Internet via Wi-Fi or wireless broadband. PCs can be found in every room of a modern primary or secondary school, from computers in classrooms, mobile laptops that are shared across classrooms, to computers in labs, libraries, and clusters, to the office machines used by support staff and administrators.

M-learning has shown increasing promotion at the professional level as well. As revealed by Fakhar (2006) in research published for the E-Learning Guild, a collaboration of several different learning organizations is underway. Pilotless one questionnaire to a group of companies now using mobile computing to educate their workforce and to companies that were considering the option to upgrade from traditional computer-assisted practices to mobile learning. He found that mobile devices were being used primarily for audio and text content.

and the attendees laptops were still the device of choice. However, the iPod and cell phone were popular as well.

CONCEPTS OF MOBILE LEARNING - ANYTIME, ANYWHERE... ANYTHING

The evolution of mobile technology originated in the last decade, and consequently, the emergence of Mobile Learning (m-Learning) has given rise to new forms of learning in different contexts. With the development of wireless networks, the m-Learning presents itself as a new extension to e-learning, and allows access to any type of information (anything), at any time (any time) and anywhere (anywhere).

M-learning- Do's and Don'ts

Mobile learning is about disseminating information and learning through a mobile device. However, under no circumstances is mobile learning a compressed version of your eLearning module on a mobile device. Here are 7 dos and don'ts of mobile learning you need to keep in Mind.

1. *Do Develop Content*
   In mobile learning "content is king", so the first thing that needs to be done when developing a mobile learning program is to identify and understand the content.
2. *Do Keep The Navigation Simple Follow the KISS (Keep It Simple Stupid)*
   methodology when you want to develop a great mobile learning program, especially when it comes to the navigation. The user interface has to be simple and easy to navigate. The user should be able to navigate the learning material with one thumb or two thumbs at the most. Mostly Instructional Designers have to bear in mind that as the screen size reduces navigation becomes harder as compared to a desktop. So creating proportional layouts and usable buttons play an

important role in creating a great mobile learning course. Additionally, learning providers also need to ensure that they keep the content easily searchable. This can be done by using simple titles and making sure the menu is simple to navigate.

3. *Do Reduce Scrolling:* Yes, there has to be a certain amount of scrolling in every m-Learning course, but a great m-Learning course will keep the scrolling to a minimum. Ensure that the content created for the module does not exceed three scroll length. In the case of a longer module, it makes sense to break up the content into different screens with an identifiable "next" button. Learning providers also have to ensure that they minimize distractions on the screen. For this, they need to keep the low-relevance items such as legal information, copyright notices, or other links that are not key to that module at the bottom of the screen.
4. *Don't Increase Information Density:*
With mobile, everything has to be crisp… even the information. Content in mobile learning has to be bite-sized and segmented keeping in mind memory limitations, battery life, and short attention spans. Having a clear content plan at the beginning of each module helps in making the objectives of the course clear. It also sets the expectation of the learner. Furthermore, you need to consider the overall file size of the course. This will help you make sure it does not compromise the storage capacity of the device, can be easily downloaded, and can be used in both offline and online modes. Small, bite-sized nuggets of information become easier to view, consume, and process, which in turn contributes to the effectiveness of the learning program.
5. *Don't Go Into The "Push" Mode:*
Mobile learning programs have to adopt the "receive" mode rather than the "push" mode. So, the course has to be designed such that it is personalized, the users can self-diagnose what they want to achieve on their learning path, and get support when they need it. Instructional Designers creating mobile learning courses that have to ensure that they create modules that the learners "interact" with. They also need to ensure that they provide the right back-end support to guide and help the learners. While creating their interventions, it is also essential now to include the social angle. Employing game-based learning strategies for assessments and tasks, providing the learners the opportunity to share their results on social media platforms, or enabling the use of social media platforms for discussions etc. also contribute to the success of a mobile learning module.
6. *Do Use Mobile Friendly Technology:*

This is an absolute no-brainer. When developing a course for mobile learning, making it responsive is not an option anymore. Also need to consider both landscape and portrait orientation when designing for mobile. Using technology such as HTML5 that is mobile friendly also helps in making mobile learning modules versatile, robust, basic, and responsive. As the mobile continues to become increasingly mobile and the millennial generation takes center stage, learning providers need to create mobile learning programs that are engaging and interactive to facilitate better learning[4].

New devices and software are tools that enable the collaboration in m-learning

- Access to anywhere, anytime learning device and after school hours
- Intra-school and classroom connection and collaboration between students, parents and teachers
- Intuitive and easy-to-use devices for younger learners (mobile, lightweight devices with touch-screen user interface)
- Educational applications and digital content such as digital textbooks
- Security solutions that ensure a safe and protected learning environment for students[5]

Innovations in m-learning

Using Mobile Devices for Language Learning

As PDAs, cell phones, and M P3 players converged into more sophisticated mobile devices, the iPod Touch emerged as a mobile device with language learning possibilities. The first generation iPod

[illegible] was equipped to perform a number of tasks, many of which could be used to accomplish a multitude of educational objectives (Banister 2010). Some of these tasks used programs such as YouTube for watching videos, iTunes for listening to music, Safari for browsing the Internet, and others.

Merits and Demerits of M-learning:

- Multimedia Ability: The ability to easily record and playback a student's voice and compare it to a native speaker's voice is a great learning tool for the language learner. Moreover, the ability to record and playback videos is another asset for learning a language. Listening to music and watching videos are very popular exercises for students as well. The ability to create and listen to podcasts is another advantage for language learning.
- Internet Access: Access to the Internet gives students the ability to search for and receive information about any topic. Searching the IMDB provides answers about movies and cast. Searching YouTube allows students to watch and listen to music videos and movie clips. Online dictionaries and other information gathering tools are used widely by students in language classrooms.

Demerits of M-Learning:

1. Distractions: While students can access dictionaries and other online information for learning during class time, the same use is inappropriate during a quiz. Also, watching videos that are not related to the lesson, playing online games, and using social networks for connecting with friends but not in the target language are inappropriate uses of the device during class and may lead to class distraction.
2. Cheating: Looking at dictionaries or searching for answers during a quiz or a test is a serious academic offense and should be dealt with appropriately.

Conclusion:

This paper has reviewed and presented the impact of mobile technology on the students learning skills and performance. It is clearly shown that the Mobile learning has a lot of merits to student's performance and learning skills, in which immediate anytime, anywhere, anything (any information) can be accessed. This technology enhances the self confidence of students and enriches the knowledge level. The other side of the coin, the same technology has some demerits like causes more distraction and technical problem leads to waste of time. Another major benefit of M-learning is help to learn language easily. Also presented some do's and don'ts of mobile learning.

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A Study On Digital Initiatives In India

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Abstract:
The purpose of this paper is to study digital initiatives taken places in Indian education system in order to enhance the quality and practical based education. The Secondary data shows that there are 33 new initiatives have been taken by the Government of India (GOI) in the last four years to strengthen the education system. These revolutionary changes provide affordable, accessibility, accountability, equality and quality education for all. "Digital India" concept is an idea for the development of Indian education with digital technology, particularly for students, professionals, and the general public. Among these, one of the greatest changes can be seen in the field of education, which is a means of empowerment by becoming aware of one's rights. The use of digital mobile devices (tablets and smartphones) in the higher education field has improved the quality of education in India.

Introduction

'Digital India' is a programme initiated by Prime Minister Mr. Narendra Modi. The motive behind the Digital India mission is to build participative, transparent and responsive governance to reach out the citizens.

It aims to provide all services electronically and promote digital literacy in India with the help of digital technologies which includes the concept of cloud computing and mobile applications have emerged as the catalysts for rapid economic growth and citizen empowerment. In this perspective, companies all over the world desire to invest in digital India mission. Remarkably, global investors like Sundar Pichai, Satya Nadella, Elon Musk have supported Modi's Digital India initiative. It is a modest step to promote egovernance or m-governance [4]

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. Digital India is a dream to ensure that government services are made available for all citizens electronically by improving online infrastructure and by increasing the effectiveness of internet connectivity with one mission and one target that is to take nation forward digitally and economically. This initiative was taken to ensure that the citizens are getting engaged in the innovation process which is necessary for the economic growth and sustainable development of the country. In order to realize the full potential of this programme, it is necessary to address certain challenges in the way of its successful implementation, like digital illiteracy, poor infrastructure, low internet speed, lack of coordination among various departments, issue pertaining to taxation etc. If implemented properly, it will open various new opportunities for the citizens of the country and therefore it requires a lot of efforts and dedication from all departments of government as well as private sector considering the current status of the programme [3].

What is education?

Education is a lifelong learning process. In other words, learning begins from the birth and ends with the death of the person. Among other things, education entails the ability to read and write. Also, education inculcates desirable human traits like honesty, sincerity, hard-work, punctuality, productivity, innovation, patriotism, selflessness, etc. Furthermore, education empowers people by inculcating lifelong skills and know-how, thereby giving an individual the capacity to liberate oneself from poverty and want. Education, when well imparted and utilized, has the potency of promoting national security. This is because national security covers the

socioeconomic, political, military, cultural, familial, industrial, diplomatic, and artistic spheres of a nation.[2]

The Impact Of Digitization

Indian Economy Impact: The economy of India has grown to 7.3 per cent in 2015 as against 6.9 per cent in 2014. The reforms taken by the government of India have yielded results as India's gross local product (GDP) at factor cost at constant (2011-12) prices 2014-15 is Rs 106.4 million (US$ 1.596 trillion), as against Rs 99.21 million (US$ 1.488 trillion) in 2013-14, registering a growth rate of 7.3 per cent.

Employment Opportunity: The 'Digital India' initiative has contributed a great deal to this positive growth. It has the potential of creating employment opportunities for 17 million people directly or indirectly, which will assist in containing joblessness in India. The government is scheduled to give IT training to 100 million people in smaller towns and villages because employment opportunity in the IT sector is very high in India. In the next 5 years, India will emerge as a leader in using IT in sectors like health, defense, education, agriculture, and banking. Moreover, the services sectors will be digitally empowered.

Education: In the field of education, the government also ensures broadband connectivity in all panchayats, schools, libraries, and other public places. Apart from broadband connectivity, every village is provided with universal phone connectivity across the country. Mobile and internet banking can improve the financial inclusion in the country and create a win-win situation for all parties in the value chain through an interoperable ecosystem and revenue-sharing business model. Telecom operators get additional revenue streams, while the banks can reach new customer groups securing lowest possible costs.

Manufacturing Sector: The digital inclusion in the country promotes the revival of the manufacturing sector in India. With the concepts of "Make in India" and "Digital India," the nation is planning to achieve net zero imports by 2020. This ensures that the exports will be equal to the imports, helping in the economic development of the nation. With the introduction of mobile connectivity in all villages, unique single portal can be maintained for all government related services. This can be done by ensuring that all databases and information are in electronic form and not manual. Now to create all, electronics hardware comprises from a major part of imports in India. Since India is a service-based country and till now it has focused only on software development, the thrust of "Digital India" on making India a manufacturing hub is bound to change the trend.[1]

Global Information: Digital Indian mission aims to host data online and engaging social media platforms for governance in the aim of the government. It also aims to build close management for data security so that citizens can easily access and can keep data safe.

Early internet programs: Government plans to set up Wi-Fi facilities in all cities, railways, colleges and universities across the country. GPS system in cars and cops are introduced in cities and metros. Biometric attendance system is being deployed in all government institutions of state and central governments offices where recording of attendance will be made online[4].

Major Initiatives Taken By The Government

Digital India programme is focused on three key ideas:-

1. Creation of Digital Infrastructure and Electronic Manufacturing in Native India.
2. Delivery of all Government Services electronically (E-Governance).
3. Digital Empowerment of Native Indian People[3]

The ambitious 'Digital India' project has always been in news for all the good reasons. The project having a total overlay of Rs 1 lakh crore aims to transform the India into a knowledge economy. It aims to ensure easy access to technology infrastructure and government services to citizens. Digital India is a dream project of the government for the citizens and industries of India which could help in connecting the various past and present projects to bring India to a global platform. Through this project government services are available for urban and rural citizens digitally or electronically. The idea is to achieve digital innovation and create positive impact for the people living in rural and urban areas. It will certainly attract investment in all product manufacturing industries. The Digital India project aims to transform the country into a digital economy with participation from rural , urban citizens and business organizations to ensure that all government services and information are available anywhere, anytime, on any device that is easy-to-use, highly available and secured. This program can certainly remove the digital gap between the rural and urban India [3].

Digital India: Major Challenges

Many people in rural areas have no Internet connection, and also the content in regional languages is not sufficient to keep the readers engaged. Only 15% of the households can access the Internet, and few people can access mobile broadband. This scenario is despite the increasing affordability of ICT environment in the country.

According to World Economic Forum (WEF) 2016 report, nearly 37% of Indian population is functionally illiterate, one-third of youth do not attend secondary education. There are vast differences in urban centers such as metropolitan cities and remote rural areas, where an even basic service for example electricity is unavailable to run the Digital India program. India's growing economy and digital push have caught the attention of hackers and an increasing wave of cyber-attacks could soon badly impact the country.

India and other South Asian countries are now on the radar of cyber attackers. The government and corporate world need to procure state-of-the-art, New Age security solutions to thwart their plans. It is not only a technological question but also deals with the question of privacy and security. The biggest challenge faced by 'Digital India' is the slow and delayed infrastructure development. Spectrum availability in Indian metros is about a tenth of the same in cities in developed countries. Challenges are in every area right from policy making, changing the work flow up to changing the mentality of the government officials. It is technological change within the most diversified nation. Within the government there are various departments which should be integrated. There is an active involvement of various departments such as telecommunication, justice, finance and planning, health department etc. Without a smooth teamwork between them, this mission would never be implemented to its full strength.

For digital technology to be accessible to every citizen, significant efforts are needed to customise apps and services to cater to local needs. Finding vendors who can provide such applications has become a challenge. Though there are resources with India but there is a huge capital cost which is to be invested and the fruits of the investment will be received after few years. Not centrally is most and it is important to understand that digital India

The biggest challenge faced by Digital India programme is slow and delayed infrastructure development. India's digital infrastructure is comprehensively inadequate to tackle growing increase in digital transactions. India needs over 80 lakh hotspots as against the availability of about 31000 hotspot at present to reach global level (ASSOCHAM).

The private participation in government projects in India is poor because of long and complex regulatory processes. Many request proposals issued by government are not picked up by competent private sector organizations since they are not commercially viable. There is a wide digital divide between urban and rural India. Till now funds have not been deployed effectively to meet the cost of infrastructure creation in rural areas.[4]

Latest Digital Initiatives Plans of GOI

The following digital initiatives are.

1. Universal Broadband
2. Universal Access Programme
3. Internet Access programme
4. Reforming Government Through IT
5. e-Kranti
6. Information for All
7. Electronics Manufacturing
8. Information Technology for Jobs
9. Early Harvest Programmes

Conclusion

From this study, it is clearly shows that the digital initiatives in India has enhanced the standard of living and IT knowledge of people. The digital India concept is grand. It is a huge step towards building a truly empowered nation. It transforms citizen access to multimedia information, content and services. India has started towards cashless economy, transparency of governance through e-governance, m-governance. This study has covered the Government of India (GOI) major digital initiatives in India, challenges and latest digital initiatives plans.

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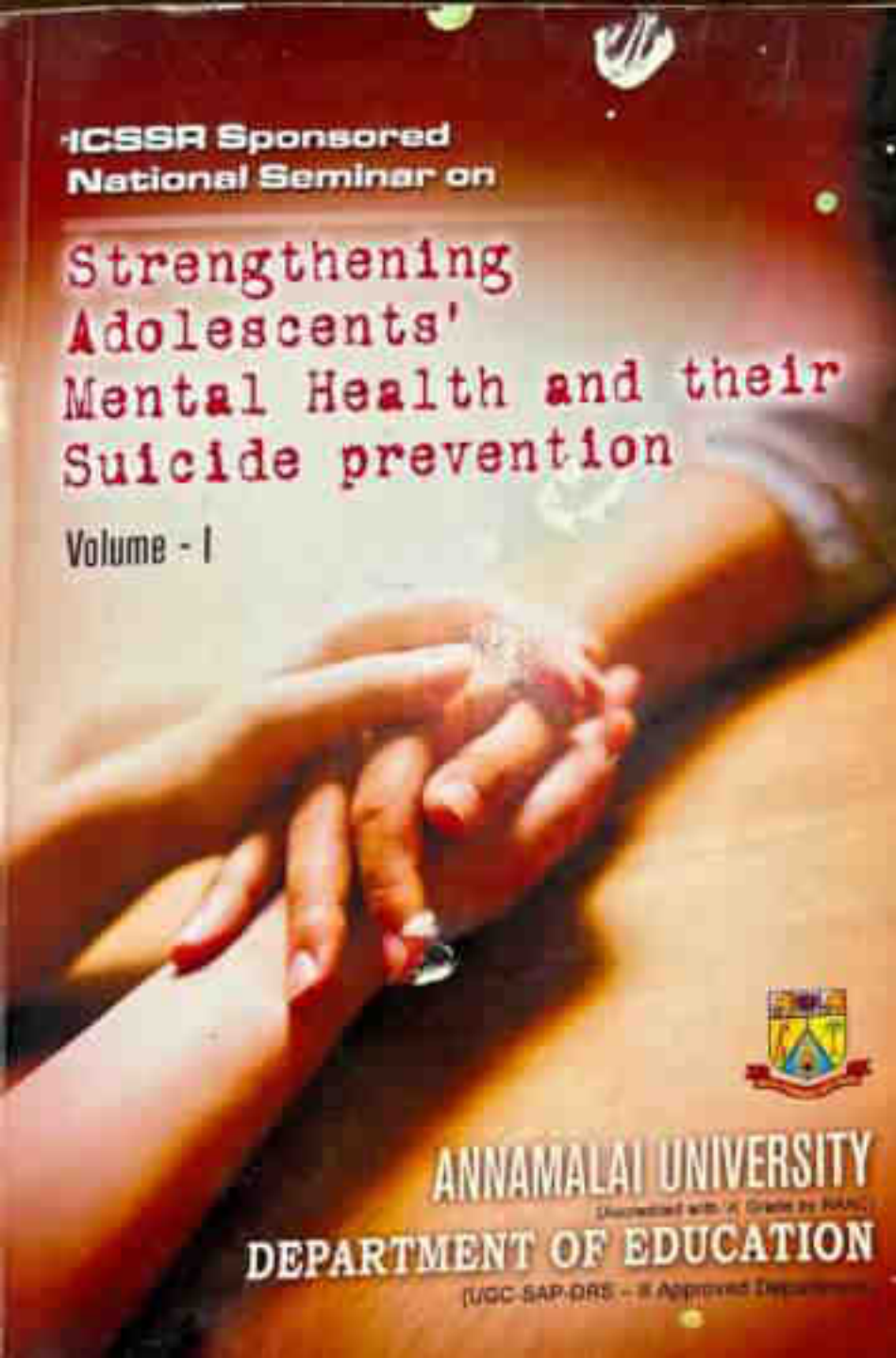

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Impact of Social Media on Mental Health

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Introduction

Generally, social media define as, "forms of electronic communication (as Web ... social networking and micro-blogging) through which users create online communities ... information, ideas, personal messages, and other content (as videos)." There has been ... concern over the past couple of decades regarding the link between social media use and ... health issues. Although research findings identify a connection between increased social media ... the young adult population and increased mental health problems in the same population, it is ... how social media use may be associated with these changes. The imbalance caused by the ... usage of social media is a great concern for parents, researchers and society regarding the ... health of individuals. One of the most common activities of present generation is excessive ... social media web sites.

The relationship between social media use and mental health in the young adult ... Current research indicates that there is a connection between increased social media ... deteriorated mental health. Unfortunately, young adults, the most active social media users, ... predominantly high risk for developing mental health issues, making this connection particularly concerning. Team sports seem to have particular associations with positive benefits for young people, and it has been suggested that there is something about the social nature of the participation ... carries the benefit, over and above physiological consequences. The benefits may be quite ... even a loose manner may feel a positive connection and shared purpose with other runners. ... effects may come from socialising or from other connections with adults and peers associated ... activity. There is a well-established literature on the general role of constructive community ... activities in promoting social capital and wellbeing. Virtual platforms of social media like ... Twitter etc. significantly enhanced the virtual environment from past decade by facilitating ... interchange their feelings, ideas, personal information, pictures and videos. Physical activity has ... associated with a wide range of psychological benefits for young people. Association between ... and physical activity and mental health outcomes for our age group have been considered to ... to preventing problems arising, promoting positive youth development, and using activity ... existing mental health conditions.

Theories – Effect of Social Media on Mental health

The Impact of Sedentary Behaviors on Mental Health

Sedentary behaviors are activities that involve sitting or lying down and are characterized ... low Metabolic Equivalent Total (MET) energy expenditure. Sedentary behaviors are performed ... slightly above the resting metabolic rate (1–1.5 METS) and encompass a range of activities ... television viewing, computer use, playing video games, and passive recreation. Social media ... encourages these sorts of sedentary behaviors. Typically, a person uses social media on ... computer or mobile device while passing the time during a sedentary activity- sitting on the ... bus, waiting in line, etc. However, more than this, social media often operates as an activity in ... itself – as in a person can sit down during leisure time specifically to check their social media ... creating sedentary behaviour rather than simply taking advantage of it. Reducing sedentary ... might be an important intervention in treatment and prevention of depressive and anxiety ... There is a connection between sedentary behaviors and mental health risks. It is unclear which ... follows the other. It may be possible that people with mental health problems fall into ... behaviors as a result of their disorders. Conversely, it is possible that sedentary behaviors ... one's risk of developing mental health issues.

Displaced Behavior Theory

One idea that may explain how the sedentary behaviors encouraged by social media affect mental health is that of displacement. People who spend more time in sedentary behaviors (like social media use) have less time for face-to-face social interaction and physical activity, both of which have been proven to be protective against mental disorders. According to displacement theory, it is not the social media use in and of itself that has deleterious effects on mental health, but rather the absence of other activities.

The displaced behavior theory argues that sedentary behaviors such as social media use could be displacing this face-to-face interaction and the benefits it offers. The social withdrawal hypothesis is one mechanism of explaining the association between increasing sedentary behaviors and increasing risk of depression.

Sleep Interruption Due to Blue Light

The mobile devices and computer screens used to view social media sites all have one thing in common: hidden within their glow, they emit high levels of blue light. This artificial light disrupts healthy sleep cycles. Night-time exposure to artificial light disrupts the body's circadian rhythm, or the 24-hour biological clock that controls our sleep cycle. Artificial light exposure often cause signals 'daytime' to our [brain], shifting the clock later. As a result, many people are still checking email, doing homework, or watching TV at midnight, with hardly a clue that it is the middle of the solar night. Technology has effectively decoupled us from the 24-hour day to which our bodies evolved.

The blue light included in artificial light is the most harmful to humans. Blue light suppresses melatonin, or the brain's "sleepy chemical," production more vigorously than other wavelengths. Blue light suppresses melatonin through one of the sensors in our eye: the intrinsically photosensitive. The theory that blue light is a culprit in disrupting sleep is supported by several studies that new sleep improvement with reduced blue light exposure.

Difference Between Social Network and Social Support

"Social networks are the number of social contacts that one has and the frequency of interaction with them. As such, social networks are objective and quantifiable. It is through such contacts and the ties or bonds that a person has with his/her friends or relatives that one receives the help that he/she needs in times of crisis.

In contrast, social support is the perception that those in the network are concerned for the welfare of the individual. As a result, social support is more subjective and slightly less quantifiable. Social support acts as a coping resource and also reflects certain aspects of social and personality development. Social support is based on one's social network and is conceptually related to it"

Social Media Negatively Impacting Mental Health

1. Low or decreased self-esteem during or after using social media.
2. Negatively comparing yourself to others via their social media content.
3. Repetitively focusing on your own shortcomings or distress while viewing others' social media feeds.
4. Frequently feeling envious of others while engaged with social media.
5. Using social media as your primary leisure activity.

6. Feeling disconnected from friends and family or not interacting with them in person as much as you normally would.
7. Decrease in ability to concentrate.
8. Increased or unusual social anxiety when interacting with people offline.
9. Feeling a need to share everything you're doing offline on social media.
10. Experiencing the negative emotional experience, "FOMO" (Fear of Missing Out) during after viewing others' online activity.
11. Consciously, consistently using social media as a distraction to avoid or suppress negative emotions.
12. Irregular or disordered sleeping patterns.
13. Increase in fatigue and/or stress during or after using social media.

Healthy Use Of Social Media

- **Subscribe to and participate** in communities that are supportive, educational and provide insight into events or areas that interest you. Use these virtual neighborhoods to help find connect and to look for articles, research and resources you might use to improve your life offline.
- **Enhance and enrich** existing offline bonds and relationships through positive feedback, posts and comments.
- **Become an active citizen!** Get involved in the causes you believe in or share, advocate and start a movement of your own. Individuals and charities have raised millions of dollars and spread awareness using social media to get their messages out – you can be a part of that too.
- **Foster goodwill, empathy and support** for others by dropping positive, constructive and helpful comments.
- **Seek out information and insights** from trusted sources to learn more about yourself and the world around you.

Conclusion

This study has highlighted impact of social media on mental health and given key points of common theories about effect of social media on mental health. Also it gives the difference between social network and social support. This paper has given the negative and positive impact of social media on mental health.

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(Study conducted under TE Plan of DSERT - 2019-20)

By

Mrs. PUSHPALATHA M B

Lecturer, DIET, Mysuru

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CERTIFICATE

Certified that this is a research report of the study entitled, ***"A CRITICAL STUDY OF THE CO-CURRICULAR ACTIVITIES ORGANIZED IN SELECTED SECONDARY SCHOOLS OF MYSORE NORTH BLOCK IN MYSORE DISTRICT"****, submitted by* ***Mrs. PUSHPALATHA M.B.*** *under Teacher Education Plan of the Department of State Education Research and Training(DSERT), Bengaluru, during the year 2019-20.*

This study has not previously formed the basis for the award of any degree, diploma, fellowship or other similar titles. This study was carried out under the guidance and supervision.

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A Study of Assessment Practices in Elementary Schools of Suntikoppa Cluster of Somvarpet Block in Kodagu District, Karnataka

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COMPETENCY BASED TEACHER EDUCATION WITH A SPECIAL FOCUS ON ENVIRONMENTAL KNOWLEDGE, ATTITUDE AND PROBLEM SOLVING SKILLS FOR SUSTAINABLE DEVELOPMENT (CBTESD)

Abstract

Competency Based Teacher Education with a Special Focus on Environmental Knowledge, Attitude and Problem Solving Skills for Sustainable Development (CBTESD)

Need for Teacher Education for Sustainable Development (TESD)

environmental changes which occur due to development along with conservation which can provide a satisfactory standard of living for everybody with minimum level of resource consumption.

Our earth has a limited carrying capacity with a finite resource base. Environment is capable of providing a quality life to all living things if these resources are utilized, conserved and properly distributed. Resources should be judiciously used and conserved with the same quantity and quality for the present and future generations. The scientific management of these resources would be viewed from their global environmental role in their sustainable development. Academic world have proved to be most fruitful and effective in the regards. Teacher Education for Sustainable Development (TESD) becomes necessary.

Teacher Education for Sustainable Development (TESD)

No education or science can be successful unless the quality of teachers is improved. The quality of teachers depends mainly on the quality of Teacher Education (TE). The quality of TE is a direct consequence and outcome of the quality of teacher educators and TE system. Bringing qualitative changes in TE system is a huge and challenging task. The aim of the present paper is to make an attempt to modify and enlighten the improved system of TE. The system basically continues to function more or less on the same principles, similar content and approaches characterized by inadequacy and unwillingness to change. However efforts are continued to greatly reduce inflation of TE in previous terms and liberate teachers and teacher educators from the conventional pedagogical, curricular and strategies and evaluation practices. A gradual emphasis has been given towards making teachers more innovative, accountable, self-confident, reflective, resourceful and communicative, contributing to development and outside. The changing needs and challenges of the modern world certainly must also be considered while changes in TE especially for Sustainable Development.

Knowledge is a vested as given in the existing TE programmes. Pupil teachers are not exposed to critically examine the objectives, curriculum, and dynamics of teaching-learning and evaluation practices. They are rarely exposed to accept and adjust to existing conditions/situations. Most of the TE programmes offer little scope for trainees to reflect on their experiences and assumptions and hence fail to empower teachers as agents of sustainable development. Teacher trainees are rarely exposed to the organization of CCA, work experience, community based work, social service activities, development awareness, environmental awareness, etc. which are considered as important components to develop environmental values and attitudes. It is also obvious that 'Quality' produces 'Quality'. Quality process norms must be developed and maintained to keep up the standards and quality outcomes while executing every activity and keep making improvements and activities related to environmental conservation and sustainable development.

The Unified TE should be comprehensive based integrated models, which should encompass all phases/components of the especially related to environment. The overall perspective to comprise with recommendations/issues should be at all levels of TE in India.

An analysis of a wide gap that is existing between noteworthy recommendations and existing practices leads to arrive at some of the hurdles and recommendations to be brought into practice in Teacher Education at the earliest in order to attain Sustainable Development. They include:

- A shift from another current approach to teacher education to bring about a change in attitude and acquire an required environmental competencies so as to meet the new environmental challenges in the society. In TE shall be mainly giving more scope for making trainees the real practical learning activities, systematic awareness of environment to understand and solve the environmental problems.
- In TE shall be more practical oriented with integrated approach. As per needs and, trainees in rural, backward, economical, etc. teacher should be exposed to practical situations related to environmental issues. It shall not be considered and developed rather, more innovative and creative based on as to help out-of-box view and solving environmental problems with modern ways in the existing practices of teaching. There should be mandatory and compulsory education activities in schools and active participation of students in TESD activities. There shall be a mandatory survey paper on general interest to environment and inter disciplinary or multidisciplinary approach. It should not be isolated from TESD. Environmental activities are to be meaningfully infused with general education.
- In short, TE in all its components need to be analyzed and modified so as to make the same more suitable to the changing needs and challenges of modern world in the light of Liberalization, Privatization and Globalization, that ultimately leads to the attainment of an desired teacher competencies for sustainable development in the changed context.

Strategy for Curriculum Development, Implementation and Evaluation of Teacher Education for Sustainable Development (TESD)

The main objectives of Teacher Education for Sustainable Development (TESD) are to develop positive attitude and a will to act in an environmentally friendly manner towards environment and also to promote an active and concern necessary to support the survival of the earth in relation to the quality of the existing environment.

Keeping this in view, suggested teacher strategies for the development, implementation and evaluation of Teacher Education for Sustainable Development (TESD) are: Formulating environmental programs which the TESD program is designed to follow; Defining the objectives or goals that the program is designed to achieve; Reviewing the literature regarding the theories of learning, instruction and evaluation practices to be employed in TESD; Formulating the curriculum keeping in view the goals of TESD program; Development of a conducive environment in the classroom keeping in view the goals of TESD; Designing strategies to overcome any possible implementation constraints; and Developing techniques and tools to evaluate the effectiveness of the TESD program.

The main vision of TESD is that by participation people can acquire knowledge and innovative ideas to develop skills and abilities, and participate in solving day-to-day environmental problems. The environment should be integrated, interdisciplinary and holistic in nature. The important strategy in TESD, therefore, is not to promote a new subject, but a new approach to improve education which cuts across various subjects and whole learning issues. In this regard, three basic approaches can be employed in teacher education viz., the integration of TESD within other subject disciplines, by creation of a separate course by treating TESD as a separate subject (Integrated) and by Organizing out-reach programs related to environmental issues. "Integrated" is currently the dominant approach to getting Education for Sustainable Development (ESD) in teacher education institutions. Two methods are feasible implementation strategies suggested in this regard.

a) **Disciplined curriculum (Interdisciplinary single subject):** This represents the conventional model in which relevant components of many disciplines are selected, processed and dwelt upon to create a balanced and coherent curriculum to integrate and to integrated curriculum. **Multidisciplinary (many subjects):** This model illustrates the integration of established disciplines with new approaches. This model allows students to apply ESD concepts and problem solving skills in various situations. Here, the ESD concept is infused into other disciplines.

Competence of Teacher Education with regard to TESD

The process Teaching can be defined as a set of observable teacher behaviors that facilitate pupil learning and "teaching competencies" means an effective performance of all the observable teacher behaviors that bring about desired learning outcomes among students. In the context of TESD teaching is the comprehensive process of designing and executing such learning situations by which many student teacher attains all the knowledge, attitude and skills related to environmental conservation.

Competence is an improved modern term applied to an ancient Human virtue. It is "the most way of doing things, the right way to live and work, in association and co-operation with others". In simple words it is, "Desired quality of job performance". In the context of education or teaching, it refers to the criteria that determine teacher effectiveness.

Competence or "teacher activities right volume knowledge, aptitude and skills, and other teacher related characteristics" (Heather, 1977). "The ability of a teacher manifested through a set of teacher related characteristics (behavior which is a result of interaction between the process and product best classroom teachers demonstrate which is a result of interaction between the process and product variables in reaching what is said to be" (Rama, 1979). In the context of TESD, the teacher education is expected to possess a wide range of interrelated competencies related to: (a) Research competency of knowledge on environmental issues (b) Interest or passion for teaching (Desire) (c) Application of knowledge on environmental issues (d) Extension (Dissemination of knowledge in solving the environmental issues), and (e) Extension (Dissemination of knowledge in solving the environmental issues. The main qualities required for any teacher, otherwise or personal functional and competent are: Intelligence, Fluency, Originality, Flexibility, Personality and Work Efficiency. Hence, a competent teacher educator makes the learning-teaching process a joyful experience for pupil / teachers and also for himself / herself i.e. he / she will. Teacher Competence is a broader concept which relates to functional personality of any individual.

With respect to teacher educators and their role in the community of society, by and large, there are numbers of generalized professional competencies. NCTE viewed, consumptions have proposed the following competencies viz. Conceptual competencies, Co-ordinal competencies, Content competencies, Personal

related to material production. Evaluation competencies. Management competencies. Competencies related to dealing with parents. Competencies related to dealing with community & other social agencies.

Teacher educators in TEIDI are expected to have knowledge of the Environmental issues. Planning of lessons and activities including teaching strategies for teaching environmental issues. Motivating learning groups to learn and apply environmental knowledge, attitude and problem solving skills. Presentation and communication skills – lecturing, explaining, eliciting responses, questioning, demonstrating, reading, administrating, using AVI aids, field based learning strategies, etc. Evaluation – Formative & Summative as well continuous and comprehensive and Total classroom management during curricular transactions. In addition to these teaching competencies, various other environmental competencies are required for a functional teacher educator to bring about a desirable and constructive modifications in pupil teachers are: Awareness building, Ensure participation and Resource mobilization & utilization. Added to these, the teacher educator should have Motivational competencies involving head of the institution, colleagues, students, parents, Management committee and community people and Value based competencies. Playing an ethical role model and developing values among student teachers related to environment and allied issues.

All these competencies need to be taken together in an interactive manner so as to produce a complex while professional competence among teachers. It is this integration of competencies that would lead to qualitative performance of professional teachers not only in the classroom but also in the whole of the community which would definitely ensure national development with sustainable development.

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Inside

B.K. Satyanarayana

Constructivist Pedagogy for Nexgen Students to Empower them to Think beyond their Reach

Competence to practice. Education is to encounter the classroom with Competence. The Teaching-Learning process before the new wave of Rationalized System needs conscious endeavours to operate building among students a true realization the future human wealth of our country. Capacity building is in terms of imparting and enhancing competence among students in areas of Knowledge, Attitude, Approach and Skills. The teacher as the facilitator has to plan and design such effective pedagogical strategies which enable students to define outcomes and construct their own knowledge in the Class Learning situation to an extension of an above stated competencies. The Teaching-Learning process like Data Administration, Analysis, Interpretation and Projects, The Process dimension using the powers of discovery and Communication by students who discover or invent with Rational Sounds and apply Objective Thinking in the class, and Product dimension encompasses the judgment components of knowledge such as Concepts, Theories, Principles, Laws, Generalizations, Assumptions etc.

In recent times pedagogical experts are strongly advocating on one such skilled, Constructivist Approach that is learner-centered and that is true to the very nature of constructive learning. This has been variously recommended as the most effective and unavoidable approach to the acquisition of different subjects and especially Science in the Secondary National Curriculum Framework 2005 (NCF, 2005) and National Curriculum Framework in Teacher Education 2009 (NCFTE) and the same has been reiterated even in NEP 2020. It is high time for everyone to think about how to enhance the effectiveness of our class and learning, how to engage the students there and improve their academic learning, how to enable them to apply their minds in right directions and how to involve them the activities of progressive society in the event to make the students to be known future custodians of our country.

In this context, it is necessary for every teacher (teacher educator) to know about what is Constructivism, How Constructivism is a learning approach and what is the educational significance. What are the different types of Constructivism? What are the characteristics of constructivist learning environment and how to create the same in classroom? What are the roles and responsibilities of Constructivist Teacher in the classroom and how to plan lessons on the principles of Constructivism by which students are engaged in learning, explore new ideas, explain to themselves, ask questions about ideas recorded for them, collect the data, organize ways to solve problems and come here to conclude at the end. Such other many more issues form the text of the present article.

There is always a wide gap between the Normative Expectations of Constructivist teachers and Realistic Realities of Constructivist Learning. This gap has to be filled at the earliest. In this context the present article finds its relevance and significance.

What is Constructivism?

It is a theory of knowledge used to explain how we come what we know. It assumes that the only tools available to a learner are his senses and it is only through these senses that an individual interacts with his environment. With these, moreover from the senses the individual constructs a personal view of world

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Constructivism as a Learning Theory

- Constructivism holds learning as a process of constructing knowledge rather than acquiring it.
- Constructivism is based on the idea that all knowledge is constructed based on previous experiences.
- In constructivism, learning is a process of building conceptual structures through reflection and abstraction (self-assessment tools).
- The focus is on concept development and long-term understanding (Piaget, 1964).
- Constructivism focuses the learner on the way the knowledge is constructed (Kroger, 2007). In this process of knowledge construction, the learner uses both personal and social knowledge from long-term memory. Working memory plays an important role in the creation of meaningful ideas, issues both visual and auditory working memory. It is significant to note that in the construction idea knowledge construction takes place in working memory.

Types of Constructivism

1. **Cognitive constructivism:** It is based on the work of Jean Piaget (1896-1980), a Swiss philosopher. Piaget's theory of cognitive development proposes that children cannot be "given" information that they immediately understand and can learn. Children must actively construct their own knowledge. They build their own knowledge through experience. Experiences enable them to make schemas or mental models; schemas are changed, enlarged, and made more sophisticated through the complementary processes called assimilation and accommodation.

   Cognitive constructivism focuses on individual learning through an individual's own experiences and interpretations. Piaget's cognitive constructivism theory does have a social element of the individual working in tandem to the environment's total influence. Cognitive constructivism emphasizes learning and knowledge from the perspective of the individual's mind or the process of learning.

2. **Social constructivism:** It is based on the work of Russian psychologist Lev Vygotsky (1896-1934). According to Vygotsky, the construction of knowledge occurs during social interaction. He argued that social interaction precedes the development of cognition. Learning is a result of the dialogue or conversation between the individual and the more capable cultural members, tools and others spoken to the world around them.

   Vygotsky's work has also produced two key concepts in the education sector. It is within the social interaction that mental meanings are shared within the group and then internalized by the individuals.

   Vygotsky's "Zone of Proximal Development (ZPD)" is probably his most famous concept. ZPD is Vygotsky's term for the range of tasks too difficult for children to master alone but which can be learned with the guidance and assistance of skilled instructors or adult children. Thus the lower limit of ZPD is the level of problem solving reached by the child working independently. The upper limit of ZPD is the level of additional responsibility the child can accept with the assistance of the instructor or more capable peers.

Characteristics of Constructivist Learning Environment

- Students are the owners of their own learning.
- Students use "knowledge construction" and not "knowledge reproducing".
- Students [illegible] experimentation activities.
- Emphasizes collaborative learning [illegible] interaction and [illegible] of mutual.
- Encourages [illegible] or unexpected experiences.
- Provides context and content [illegible] knowledge construction.
- Emphasizes learning and not teaching; this is student-centered approach.
- Encourages critical awareness and reflection.
- Values of learning as a process and not as a product, i.e., it's more a process than a product.
- Encourages [illegible] learning from "mistakes as a learning".
- Facilitates learning within [illegible] to environment.
- Uses the learner's knowledge and interest as the grounds on which the new learning experiences are designed.
- Includes learners in real world situations that may lead them to [illegible] learning based on the situations or learned issues.
- Questions the beliefs and principles of the learners rather than [illegible] it unchecked.
- Supports cooperative learning in order to [illegible] communication.
- Emphasizes participatory and interesting ways [illegible] learners.
- The learner's [illegible] of [illegible] and [illegible] are nurtured with self-evaluating environment.

Role of Constructivist Teacher in the Constructivist Classroom

- Realizes role of prior knowledge and misconceptions from long term memory in learning and activates it.
- Engages students in constructivist challenges previous conceptions of their existing knowledge.
- Allow students to construct their own knowledge and look for connections in their responses.
- Allow students time to think after questions for probing questions.
- Encourages and accepts the questioning by thoughtful, open-ended questions.
- Encourages thoughtful discussion among students.
- Encourages students to seek out, identify, analyse and resolve their thinking habits.
- Encourages and accepts student autonomy and initiation.
- Be willing to let go of classroom control.
- Use raw data and primary source along with manipulative, interactive physical materials.
- Inquire on their experience from analysis.
- Encourages students to reconsider their understanding when they have new knowledge learned.
- Promotes student leadership, collaboration, location of information and testing of ideas as a result of the learning process.
- Encourage the use of alternative means for communicating both from within classroom and experts.
- Seek out student ideas before presenting teacher ideas.
- Encourage students to challenge each other's conceptual ideas and allow students to solving real life problems.
- Extend learning beyond the classroom, classroom and the school.

One of the most popular and powerful constructivist models based on constructivist theory is the 5Es model which was developed by Biological Science Curriculum Study (BSCS). Bybee, Rodger W. (1997) Achieving Scientific Literacy: From Purposes to Practices. Portsmouth, NH: Heinemann. The 5Es stands for the following words mentioned as in future.

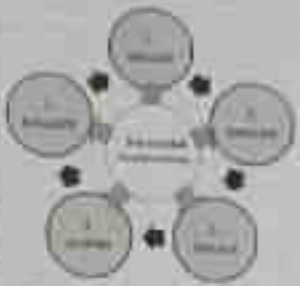

Figure: The 5 's Model – a Good Model for Constructivist Classroom

Stage 1: Engage: Facilitating learning on previous knowledge and misconceptions and arousing curiosity in the subject matter and learning tasks is the main purpose of this stage. At the same time the situation should be presented to engage students' attention in learning tasks. Learners are to engaged in different ways based on students' existing knowledge, previous learning and a problem-like situation. Define a problem, planning, organizing, controlling an assigned phenomenon, considering possible responses to questions, presenting observations about a paragraph, etc.

Stage 2: Explore: In the stage learners are given time to plan and find answers for the questions raised during the engage stage. Teacher's role is to structure and present learning environments which facilitate learners to involve in investigation activities and provide opportunities for students' experiences related to the learning process and construction of knowledge.

Some of the exploring activities can be group discussions, observations, hands-on work in lesson, experiments, web searches, use their libraries to access the previous studies and knowledge, etc. Students are encouraged to ask questions, explain their ideas, make predictions, design investigations, collect data, analyze and interpret data, and draw conclusions. Teacher's role is to facilitate learning, ask questions, provide resources, and encourage students to work together.

According to constructivist approaches, it is very important to encourage small groups of 3 to 5 members while working in the above mentioned activities or any appropriate activity. Cooperative learning strategies are very useful for this purpose.

Stage 3: Explain: In this stage, students in the learning activities and personal interactions, develop their prior knowledge towards their concepts, explanations and procedures. Experiences should encourage through communicable tasks in the context of the challenge.

Their knowledge constructed by students are expressed orally and/or in writing. Students explaining their constructed ideas, describing and explaining a model, reviewing and reflecting with their experiences about through presenting and possible reasoning, information through scientific processes, a scientific term, etc. Teacher's role is to facilitate learning, ask questions, provide resources, and encourage students to work together.

Stage 4: Expand: In the fourth stage the teacher provides opportunities and guidance for students to apply the constructed knowledge in novel and life situations. The students are also provided the newly constructed knowledge to other related fields/activities. These can be extending and further lead to new experiences and understanding.

The tasks that students can perform at this stage are: apply knowledge and skills in real life situations, transfer knowledge in skills, make inferences and show learning patterns and provide answers and new questions.

Stage 5: Evaluate: At this stage the teacher evaluates whether the students have constructed the

Teacher Enrichment / Resource Books

Book Name	Author	ISBN	Price
Health & Physical Education	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
Yoga Education	[illegible]	[illegible]	[illegible]
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Environmental Education	[illegible]	[illegible]	[illegible]
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Guidance and Counselling	[illegible]	[illegible]	[illegible]
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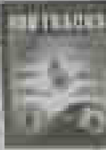

EFFECTIVENESS OF TEACHING SOCIAL SCIENCE THROUGH SMART CLASS METHOD ON THE ACHIEVEMENT OF CLASS IX STUDENTS

THESIS SUBMITTED TO BHARATHIAR UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN EDUCATION

BY

JOHNY K. P.

(Reg. No. Ph.D-CE-JUL2014-0210)

UNDER THE GUIDANCE OF

Dr. H. N. VISHWANATH

PROFESSOR IN EDUCATION

SARADA VILAS TEACHERS COLLEGE, MYSURU

CENTRE FOR RESEARCH AND EVALUATION

BHARATHIAR UNIVERSITY, COIMBATORE - 641 046

TAMILNADU, INDIA

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MARCH 2021

CERTIFICATE

This is to certify that the thesis entitled, **"Effectiveness of Teaching Social Science through Smart Class Method on the Achievement of Class IX Students"** submitted to the Bharathiar University, in partial fulfillment of the requirements for the award of the Degree of Doctor of Philosophy in Education is a record of original research work done by **Mr. JOHNY K P**, Reg. No: Ph. D – CB. JULY 2014-0210, during the period 2014-2021 of his research in the Centre for Research and Evaluation, Bharathiar University, Coimbatore 641046, under my supervision and guidance and the thesis has not formed the basis for the award of any Degree/Diploma/Associateship/Fellowship or other similar title of any candidate of any University.

Date: 22-3-2021

Signature of the Guide

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Counter Signed

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SMART CLASS: A FUTURISTIC TECHNO BASED INSTRUCTIONAL STRATEGY FOR CONSTRUCTIVE LEARNING IN RELATION TO FIVE ES MODEL

JOHNY K.P., Bharathiar University, Coimbatore
Dr. M. P. Vishnunath, Bharathiar University, Coimbatore

Introduction

Teaching and learning are the prime and pivotal process of education since time immemorial. As years passed, teaching and learning process had undergone number of changes from time to time, culture to culture. With the advent of technology in education, techno based instructional strategies education has become an inevitable part of the contemporary education system at various levels teaching learning process. Students who are vibrant and inquisitive in nature, live in the world of technology, prefer to enhance knowledge and skills using technology at their space and time. dynamic aspect of learners and techno culture of the society prompt teachers to adapt strategies would boost interactive learning among the students. Therefore, the present study proposes Smart Class Futuristic Techno Based Instructional Strategy for Constructive Learning in relation to Five Es Mo proposed by Roger W Bybee. By using Smart Class technology, teachers can create constructive lea environment for the pupils to generate conceptual knowledge through reflective learning.

Meaning of Smart Class

Smart Class is an advanced technology implemented for schools which provides tools and other [illegible] teaching and learning, using latest media presentations. It is a type of e- class room method [illegible] reading and learning. Learning through a technology-enhanced learning system capable of creating [illegible] virtual society with digital resources can be termed as a smart class learning system. Smart classroom is [illegible] synergy for comprehensive digital education or schools. Smart classroom management, Smart Learning [illegible] environment, Smart Learning Materials, Internet, projector and other multimedia devices are the main [illegible] parts of Smart Class. Smart Class environment enables students to access digital resources and interact [illegible] with learning systems at any place and at any time. It is also actively providing the necessary learning [illegible] patterns, hints, and supportive tools for learning in the right place, at the right time and in the right way. [illegible] The key to the strategy is that it is student-centric, recognizing the demand, from both students and their [illegible] parents, for seamless offset between learning in school and at home.

Smart class is an information software package which bring quality of content and methodology [illegible] teaching and learning. It helps teachers and students to break the barriers of time and space. Smart class [illegible] room is a concept that takes advantage of Information Technology providing instant and non-linear [illegible] access to students, teachers, school management and parents with a focus on creativity and collaborative [illegible] learning and teaching. Smart class is presented in two perspectives of digitalization in education. They are [illegible] digital communication and digital instructional technologies. Digital communication technology includes [illegible] digital lesson plans, email communication, homework and group activities through SMS. Instructional [illegible] technologies like software programmes on various themes, multimedia presentations, video conferences and [illegible] films. Smart Class is used as an advanced instructional and learning strategy for various subjects in [illegible] schools.

The important features of Smart Class are:

1. Smart class is Student-centric classroom that focus on each student's needs, abilities and learning [illegible] styles.
2. The interactive nature of technology offers learners an opportunity to share and participate in [illegible] instructional process. Every learner has an opportunity to participate or contribute to [illegible] presentations and discussions.
3. Smart Class acts as an environment for the enjoyable learning.

4. Online approaches in Smart Class help teachers to source the various relating sources of particular topics and collect the opinions of the experts on a topic.
5. It promotes Group learning activities including collaborative writing, group projects, joint problem solving, debates and essays.
6. Smart class has the facility to upgrade constantly the resources of learning.

Concept of Constructive Learning

Constructivism in education is basically a theory based on observation and scientific study [illegible] how people learn a concept or ideology. It is defined as a process of constructing [illegible] representation of external reality through experiences. It is said that people construct their [illegible] understanding and knowledge through experiencing things and reflecting on those experiences. [illegible] encounter new things, we have to reconcile it with our previous ideas and experiences, may be changing what we believe or discarding new information as irrelevant. In both ways we become creators of new knowledge through engaging, exploring, explaining, expanding, and evaluating the concept.

Constructivism assumes that learning takes place through the dual factors of social interaction [illegible] simultaneous exposure to cognitive experiences. The sources of cognitive experiences are [illegible] feedbacks, and previous experiences. It promotes a shared responsibility among students and [illegible] students are given necessary structure, voice, time and space, to question and explore the meaning [illegible] phenomena and concepts. Constructivism states that students are capable of accepting the [illegible] take charge of their own learning. They're responsible to develop essential intrinsic motivation [illegible] confidence in learning. According to Boaler- Araje and Jones(2002), constructivism can be defined [illegible] the idea that development of understanding requires the learner to actively engage in meaning-making. It is based on the belief that learning occurs as learners are actively involved in a process of meaning [illegible] knowledge construction. It promotes critical thinking and create motivated and independent learners.

Characteristics of Constructive Learning

1. In Constructive learning environment, students actively participate to generate new knowledge.
2. Students are not passive listeners but active producers of knowledge.
3. Provides multiple representation of realities.
4. Encourages thoughtful reflection and multi-sensory experiences.
5. Supports co-operative learning.

9. Encourages learner autonomy and initiative.
7. Emphasis on performance and understanding when assessing learners.
8. Class starts become dynamic questions are raised by the students and explored and integrated into the instructional dialogue of the classroom.
9. Constructivism gives students ownership of what they learn and abilities to express knowledge through a variety of ways.
10. Constructivism concentrates on learning how to think and understand.
11. Students in constructivist classrooms learn to question things and to apply their natural curiosity to the world.
12. Constructivism promotes social and communication skills by creating a classroom environment that emphasizes collaboration and exchange of ideas.
13. The teacher facilitates a process of learning in which students are encouraged to be responsible and autonomous. It becomes interactive and student-centred.

10

Smart Class – A Booster for Five E's Model in Constructive Learning:

Smart Class is a futuristic techno based interactional Strategy for Constructive Learning where it is used as a digital communication and instructional strategy in class room. Constructive learning is a process of interaction between learning activity and learner. In Constructive learning environment students actively participate to generate new knowledge. The teacher facilitates the process of learning in which students are encouraged to be responsible and autonomous. There are many ways Smart Class is used as an instructional strategy for constructive learning.

In a Constructive learning environment, students actively participate to generate new knowledge and Smart Class is Student-centric classroom that focuses on each student's needs, abilities and learning styles. It enhances them to generate new knowledge as they live with technology in daily life.

Students are not passive listeners but active producers of knowledge in constructive learning. Smart Class offers learners an opportunity to share and participate in the instructional process. Every learner has an opportunity to participate or contribute to the presentation and discussion. Therefore, Smart Class helps them to construct knowledge with available resources.

Online approaches in Smart Class help students to access the various related [illegible] of a [illegible] theme and collect the opinions of the experts on a topic while respecting and exploring the [illegible] constructive learning.

Since Smart Class promotes Group learning activities including collaborative writing, group [illegible], joint problem solving, constructive learning strategy can adopt Smart Class as a [illegible] to classroom.

Constructivism gives students ownership of what they learn and abilities to [illegible] through a variety of ways. The digital communicating [illegible] of Smart Class is a platform to [illegible] views in the class room and outside the classroom.

Education works best when it concentrates on thinking and understanding, rather than on [illegible] memorization. Constructivism concentrates on learning how to think and understand. This constructive [illegible] is enhanced when smart technology is implemented in learning process.

Constructivism promotes social and communication skills by creating a classroom environment that emphasizes collaboration and exchange of ideas. Students learn how to articulate their ideas clearly as well as to collaborate on tasks effectively by sharing in group projects. Students exchange ideas and must learn to "negotiate" with others and to evaluate their contributions in a socially [illegible]. Through Smart Class they are open to the world of experts and virtual situations to improve their communication skills and [illegible] to evaluate their contributions.

One of the most popularly used instructional models based on constructivist theory is Five E's Model developed by Roger Bybee. Five E's represents five stages in learning, viz. Engage, Explore, Explain, Elaborate, Evaluate. All these stages in learning is made easy as we use Smart Class as platform for learning. The first stage Engage focus on facilitating learning environment and situations for learning. Therefore, learners can be engaged in different ways of raising questions, showing surprise events or problematic situations using Smart Class technology. In second stage students are guided to explore and find answer for the questions they raised in first stage. Teachers can facilitate these events in power point presentation and help them to experience these issues using technology. Students can [illegible] the authenticity of the discussions using search options in internet and alternatives expert opinions on the raised issues. The third stage of constructive learning is to explain the constructed ideas. Explanations can be presented through pictures, charts, graphs, symbols, and description. These activities can be [illegible]

enhanced by using Smart Class and Internet based learning. Expanding stage of constructive learning is to apply the knowledge and skills in real life, share information and ideas to the world of knowledge. By using smart technology it becomes easy for the learners to share the findings with peer groups and the world outside. The final stage of constructive learning is evaluation. According to them evaluation should be diagnostic in nature; check list for observation, mind mapping, performance assessment can be carried out through Smart Class technology. Smart Class enables students to assess their performance and make improvements in it. In short Smart Class is a futuristic techno based instructional strategy for Constructive Learning in relation to Five E's Model.

Conclusion

Education system is being transformed through the advancement of technology in contemporary society. Introduction of Smart Class technology has become a common instructional teaching and learning mode in most of the schools in our state. It promotes child centred and effective learning strategy in education system. This pupil-centered teaching learning enhances constructive learning skills in the contemporary era. In Constructive learning environment, students are actively participating to generate new knowledge and skills for the future life. By using Smart Class as technology, teachers facilitate the process of constructive learning and encourage students to be responsible and autonomous learners. The stages of constructive learning viz. engage, explore, explain, expand and evaluate are enriched by the use of Smart Class in teaching and learning process.

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MIND THE GAP: RELEVANCY OF TEACHER EDUCATION

THEME 1 INCLUSIVE EDUCATION

CONSTRUCTIVIST APPROACH: EMPOWERING PEDAGOGY TO ENABLE STUDENTS THINK BEYOND THEY REACH & REACH BEYOND THEY THINK

Dr. H.N. Vishwanath*

Introduction

Education is to empower the students with Competence and Competence is power. Teaching – Learning process being the very heart of Education System finds enormous significance in Capacity Building among students who constitute the future human wealth of our country India. Capacity building is in terms of improving and enhancing competence among students in terms of Knowledge, Attitude, Aptitude and Skills. Teacher hereafter termed facilitator has to plan and design such effective pedagogic strategies which enable students think rationally and construct their own knowledge in the class. Learning should be an enterprise of an open-ended exploration. Teaching-Learning process will have two dimensions, namely, Process and Product. The Process Dimension being the process of discovery and Inventions by student who is a discover or inventor with Rational Attitude and applying Objective Thinking in the class; and Product dimension encompasses the different components of knowledge such as, Concepts, Theories, Principles, Laws, Postulates, Rules, Assumptions etc.

Constructivism: It is a theory of knowledge used to explain how we know what we know. It asserts that the only tools available to a knower are the senses and it is only through these

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means that an individual interacts with the environment. With these interactions [illegible] allows the individual constructs a picture of the world.

Constructivism as a Learning Theory

- Constructivism views learning as a process of constructing meaningful representations [illegible] of reality through experiences.
- Constructivism is an educational theory that places emphasis on the learner [illegible]
- Constructivism is based on the idea that all knowledge is constructed based on [illegible]
- Constructivism is a process of building conceptual structures through [illegible] experiences.
- In constructivism, learning is a process of building understanding [illegible] and interaction (Von Glasersfeld, 1989).
- The focus is on concept development and deep understanding [illegible] the knowledge is constructed by the learner.
- Constructivist perspective focuses on the way the knowledge is constructed [illegible] the process of knowledge construction [illegible] in the working memory (Khalid, 2003). In this process [illegible] from the environment and prior knowledge [illegible] long term memory. Working memory gives meaning to incoming information [illegible] which includes both visual and auditory working memory. It is significant to note that [illegible] construction takes place in working memory.

Types of Constructivism

1. **Cognitive constructivism:** It is based on the work of **Jean Piaget** (1896-1980), a Swiss philosopher. Piaget's theory of cognitive development proposes that children cannot be "given" information that they immediately understand and use. Instead children must "construct" their own knowledge. They build their own knowledge through experience. Experiences enable them to create schemas or mental models. Schemas are changed, enlarged and made more sophisticated through two complimentary processes: **assimilation and accommodation.**

Cognitive constructivism focuses on **individual cognitive development** through [illegible] constructed learning environment in which individual(s) construct knowledge individually [illegible] based on past experiences and through [illegible] process. Piaget's cognitive constructivism [illegible] the **individual**, restricting its domain [illegible] individual's head. Cognitive constructivism approaches learning and knowing from the perspective of the individual involved in the process of learning.

2. **Social Constructivism:** It is based on the work of Russian psychologist, **Lev Vygotsky (1896 – 1934)**. According to Vygotsky, the construction of knowledge occurs through [illegible] social constructivism proposes that the development of [illegible] the social world. [illegible] relationship between the individual and [illegible] the social [illegible] cultural [illegible] form the basis for the emergence of [illegible] Vygotsky notes that [illegible] the cultural meanings [illegible] children's [illegible] social interaction [illegible] shared within the group and then internalized by the individuals. Vygotsky's "**The Zone of Proximal Development (ZPD)**" is probably his best-known concept. ZPD is Vygotsky's term for the range of tasks too difficult for children to master alone but which can be learned with the guidance and assistance of adults or more-skilled children. Thus the lower limit of ZPD is the level of problem solving reached by the child working independently. The upper limit of ZPD is the level of additional responsibility the child can accept with the assistance of an able instructor or more capable peer.

Characteristics of Constructivist Learning Environment

- ✓ Students are not passive recipients of information rather active "producers of new knowledge".
- ✓ Stresses on "knowledge construction" and not "knowledge reproduction".
- ✓ Provides "multiple representations" of reality.

- Emphasizes authentic tasks in a meaningful context rather than abstract instruction out of context
- Encourages thoughtful reflection on both learning experiences
- Enables context and content dependent knowledge construction
- Emphasizes learning and not teaching, that is, student-centered not the case
- Encourages learner autonomy and initiative
- Thinks of learning as a process and not as a product, i.e., it's about a process than a product
- Encourages learner inquiry that leads to autonomous learning
- Nurtures learners natural curiosity or inquisitiveness
- Takes the learner's mental model into account on the grounds of which the new learning experiences are designed
- Involves learners in real world situations that may lead them to solving classroom learning to real life situations as improved tests
- Considers the beliefs and attitudes of the learners rather than that of teachers
- Supports co-operative learning in a conducive classroom atmosphere
- Emphasizes performance and understanding when assessing learners
- The salient elements of Enthusiasm and Improvement are married with Self-Learning environment

Role of Constructivist Teacher in the Constructivist Classroom

- Become one of many resources that the student may learn from, the primary source of information
- Engage students in experiences that challenge previous conceptions of their existing knowledge
- Allow student responses to drive the lessons and seek elaborations of students' initial responses
- Allow students some thinking time for posing questions
- Encourage the spirit of questioning by thoughtful, open-ended questions
- Encourage thoughtful discussions among students
- Use inquiring terminology such as 'classify', 'analyze', and 'create' when planning tasks.
- Encourage and accept student autonomy and initiative.
- Be willing to let go of classroom control
- Use raw data and primary sources, along with manipulative, interactive physical materials.
- Based on their responses from students
- When students can demonstrate their understanding, then they have truly learned.
- Promote student leadership, collaboration, facilitated relationships and taking actions as a result of learning process.
- Encourage the use of alternate sources (resources) aside from written materials and experts
- Seek out student ideas before presenting his/her ideas.
- Encourage students to challenge each other's conceptualizations (ideas) (student to student interaction)
- Extend learning beyond the classroom, classroom and the school.

Five E's Model: A model based on Constructivist Approach:

One of the most popular and quite clear and instructional model based on constructivist theory is

Five E's model, which was developed by **Roger Bybee**. Several instructional strategies can be

evolved using this model.

Five E's model can be diagrammatically represented as follows

Stage 1: Engage: Facilitating learning environment, learning activities and scenarios and exposing the mind's of learners on the higher order learning tasks is the main purpose of

...

Stage 2: Explore: ...

Stage 3: Explain: ...

Stage 4: Expand: ...

Stage 5: Evaluate: ...

Problems Related to On-line Teaching - Learning of Teachers & Students and their Attitude towards Virtual Education in COVID-19 context

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CERTIFICATE

This is to certify that Smt. R K Lavanya, student of M A (Education) from Indira Gandhi National Open University (IGNOU), New Delhi has worked under my supervision and guidance for her dissertation for the course MESP-001. Her Dissertation entitled **"PROBLEMS RELATED TO ON-LINE TEACHING - LEARNING OF TEACHERS & STUDENTS AND THEIR ATTITUDE TOWARDS VIRTUAL EDUCATION IN COVID-19 CONTEXT"** which she is submitting, is her genuine and original work.

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REFORMATION IN HIGHER EDUCATION: CHALLENGES, CONCERNS AND NEW DIRECTIONS

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A constructivist - A Model for social Mathematics in Science Pedagogy at Higher Education: By: [illegible]

Introduction

[illegible]

Constructivism as a learning theory

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

Types of constructivism

1. Cognitive constructivism: It is based on the work of **Jean Piaget** (1) In this, a learner constructs knowledge through personal experiences. He believes that children actively do "**play**" activities that they personally understand and use. Second stage is their "**assimilate**" their own knowledge. They must first make [illegible] meaningful experiences. Experiences usually driven by inner children or mental models, children are challenged, challenged and assimilate these experiences through [illegible] **accommodation and assimilation**

Cognitive constructivism focuses on **individual cognitive development** through personal experimenting, development or children's [illegible] **individually** focused on their exploration and thought [illegible]

Piaget's cognitive constructivism theory considers the idea of interaction **by individual** in learning in which individual involved in the process of learning.

Social constructivism: It is based on the work of Russian Psychologist, **Lev Vygotsky** (date : 1934) "Interesting" by Vygotsky. The construction of knowledge occurs through participation in the social world. Social interaction with [illegible] the development of cognitive functions and the internalization of [illegible] between the individual and the [illegible] Cultural symbols, tools and various systems in the social environment.

Characteristics of constructivist learning environment

- Students are not passive recipients of information rather active "**producers of knowledge**"
- Emphasis on "**knowledge construction**" and not "**knowledge reproduction**"
- Provides "**authentic representations**" of reality

[illegible]

- Emphasizing authentic tasks in a meaningful context rather than abstract instruction
- Encourages thoughtful reflection on both individual experiences
- Fosters personal and context dependent knowledge construction
- Emphasizes learning and not teaching, that is student centered not the case
- Encourages blame autonomy and ownership
- Thinks of learning as a process and not as a product, i.e., it's more a process than a product
- Encourages learner inquiry that leads to passionate learning
- Nurtures learner's mental curiosity or experimentation
- Takes the learner's mental model into account on the grounds of which the new knowledge are designed
- Teaches learners in real world situations that may lead them to develop alternative hypothesis, solutions or required tasks
- Considers the beliefs and attitudes of the learners rather than that of teachers
- Supports an experience learning in a productive classroom atmosphere
- Emphasizes performance and understanding when assessing learners
- The natural mistakes or differences and inconsistencies are welcomed with full encouragement

Role of Constructivist Teacher in the Constructivist Classroom

- Becomes one of many resources that the student may learn from, the primary source of learning
- Poses challenges or experiences that challenge previous conceptions of their existing knowledge
- Allow student responses to drive the lessons and seek clarifications of students' ideas
- Allow students some thinking time for posing questions
- Encourage the spirit of questioning by thoughtful, open-ended comments
- Encourage thoughtful discussions among students
- Use cognitive terminology such as 'classify', 'analyze', and 'create' when framing tasks
- Encourage and accept student autonomy and initiative
- Be willing to let go of classroom control
- Focus on clear expectations from students. When students are empowered to learn rapidly and learn more learned. Promote student leadership, collaboration, inclusion of interaction and negotiation as a result of learning process.

Five E's Model- A model based on Constructivist Approach

One of the most popular and quite often used instructional model based on constructivist theory is 5E model, which was developed by Roger Bybee. Five E's model can be characterized by

Stage 1/ Engage: Facilitating learning environment, learning activities and choices of learning methods of learners on the higher order learning tasks is the main purpose of this stage. In this stage, questions should be presented to engage student's attention on learning tasks.

Stage 2- Explore: In this stage, learners are guided to explore and find answers for the questions raised during the engage stage. Teacher's role is to structure and promote learning environment in which learners are involved in group activities and given the opportunities for students to go more in discovery process and construction of knowledge.

Stage 3. Explain: Students, who engaged in the learning activities and worked collaboratively, explain new knowledge (scientific facts, concepts, generalizations and procedures) and communicate with each other. Explaining this abstract knowledge through communication, here is the purpose of this third step.

Stage 4. Expand: In the fourth stage, the teacher provides opportunities and guidance to students to use the constructed knowledge in natural real-life situations. The students can also explore for more knowledge to other related fields of knowledge.

Stage 5. Evaluate: In this stage the teacher evaluates whether the students have constructed scientific knowledge adequately and also have developed conceptual understandings. Assessing understanding and evaluation should be in the as possible diagnostic in nature.

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EXAMINING EMERGENT INSTRUCTIONAL MODELS FOR NEW GENERATION PHYSIOLOGICAL SUSTAINABILITY

Dr. H.S Venkatesan

Introduction

Synaptic Connectivity

Synaptic Connectivity

Connectivity as a Functional Strategy

Connectivity as a Functional Strategy

1. Teacher vs. Student
2. Student vs. Subject
3. Subject vs. Self
4. Self - Subject

Understanding between the teacher and learner has impact on academic success and various studies on the importance of classroom talk and environment in the subject. The teacher has important influence and sets the classroom environment with attitude of teaching.

There is interaction between student, between the student and subject. Here students engage with the information between them [student and their teacher's learning. Another factor that teacher's must consider to enhance student understanding and improvement.

The connectivity of a teacher to the subject is reflected in:

Content Competence - Knowledge, Skills and Attitude towards subject

Love and interest levels in the subject

The enthusiasm shown by teacher in teaching the subject

Preparation is essentially conducted on the subject of teaching

Updating themself study the latest books and study related to the subject taught.

Creating interest, wider explanations and thinking connections of teaching or learning the subject.

Mastery over the dimension of students learning of the subject.

Sound knowledge of extracurricular subject to interest life

Facilitating students greater learning of the subject

Use of innovative approaches and Pedagogical strategies.

2. Self - Student

In your student contact with their students, they could expect to see enthusiasm and have strong engagement in the learning process. The relationship between a teacher and his students is very diverse and one of the most influential factors in a learning environment. This have a high impact on students progress, learning engagement in school and academic achievement.

Positive teacher-student relationships lead to better teaching and learning. Positive teacher-student relationships help students meet their all types of needs – academic, social, emotional and psychological. Teachers often give feedback to students to support their feelings of competence in gaining of knowledge, Skills and Aptitude. Teachers who know their students' interests, and preferences, and show regard and respect for these individual differences, boost the students' feeling of competence.

Teachers shall create an environment that incorporates mutual respect. There is a lot to be learnt through strong relationships between students and teachers. Students are motivated to work hard when they have positive relationships with their teachers because they feel that someone is paying attention to them.

Positive teacher-student relationships promote student academic achievement, such as better grades and scores, but a new study at the University of Missouri found positive teacher-student relationships lead to better teaching as well. The findings prove the importance of teacher demonstrating 'soft' skills, or pro-social behaviors, in the classroom – such as showing kindness, compassion and caring for others – and not the other way round where teaching students the conventional 'hard' skills of reading, writing and arithmetic.

One reason for that is students tend to be more motivated to learn and be engaged in the classroom when their teacher likes and cares about them. Positive teacher-student relationships change student behavior, and in this study, we found building these positive relationships actually leads to better teaching, too. It changes teacher behavior. High-impact teaching practices linked with student achievement are often difficult to execute as they consume lot of time and resources. One way to achieve high-impact teaching practices is to promote caring teacher-student relationships.

[illegible]

3. Student - Subject

How to connect student to the subject or vice versa? Every individual student is unique in terms of ... personality components that would determine differential learning [illegible]

1. Specifying the need and importance of learning the subject
2. Connecting the Subject to students' life and enabling how solve the problems applying the knowledge
3. Make him feel the subject easy and interesting
4. Reflect the expectations with regard to interest, aspirations and enthusiasm of students in learning a subject
5. Be at your best in making students feel the subject, not just mechanically [illegible] parenting, [illegible] of the student
6. Make learning more enjoyable with interaction using thought provoking questions especially how and why questions
7. Make learning more realistic with multiple sensory perception
8. Make it challenging and competitive, but ensure that there is a support system for the kids who cannot compete effectively.
9. Practice mindfulness in students with regard to learning, analysis and integration of [illegible] and subject
10. Help students cope with stress and setbacks through empathetic ways
11. Celebrate with students for their success and [illegible] in the subject.

While learning to the class

4. Student - Life

"Without application in the world the value of knowledge is greatly diminished"

Why it is important to apply the gained knowledge?

- The application of knowledge is necessary to achieve desired results throughout various aspects of life.

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Theme – 3

GAMIFICATION: A STATE-BASED INNOVATIVE PEDAGOGY FOR ENGAGING 21ST CENTURY

Dr. H.N Vishwanath,

Abstract

Gamification is the use of game thinking, approaches and elements in a context different from the games. Using game mechanics improves motivation and learning in formal and informal situations. Various definitions overlap and can be summarized as follows. **Gamification is the integration of game elements and game thinking in activities that are not normally games.**

Games have some distinctive features which play a key role in gamification:

- **Users** who are participants – students (the educational environment), employees or clients (the companies).
- **Challenges/tasks** that users perform and progress towards defined objectives.
- **Points** that are accumulated as a result of completing tasks.
- **Levels** which users progress depending on the points.
- **Badges** which serve as rewards for completing actions.
- **Ranking of users** according to their achievements.

Differences between Gamification and Serious Games

There are some terms and concepts that have similarities - gamification, game inspired design, serious games, simulations and games. The boundaries between them are not clearly defined.

Game inspired design is the use of ideas and ways of thinking that are inherent in games. Game inspired design does not require to adding game elements, but rather to using of playful design.

Gamification is the use of game mechanics, game elements and ideas in a context different from that of the games in order to increase motivation and commitment, and to influence user behavior (Marczewski, 2013). **Serious games** are games designed for a specific purpose related to training, not just for fun. They possess all game elements, they look like games, but their objective is to achieve something that is predetermined.

Simulations are similar to serious games, but they simulate real world things and their purpose is user training in an environment resembling real life.

Games include everything mentioned above and they are designed for entertainment.

All the above-mentioned concepts have one thing in common – they use elements that are current in games and their purpose is to support learning and to improve users' engagement.

Rationale in using Gamification in education

According to Gabe Zichermann, cited by (Chang, 2013), the use of game mechanics to motivate students to learn new skills by 48%. Game approaches lead to higher level of commitment and

- **Badges.** Badges can be given to learners upon completion of a number of activities or for achieving a certain level of knowledge and competence. They can be used to display students' achievements and rewards. Learners can share and demonstrate their badges and achieve moral recognition (The Beginner's Guide to Gamification). Moodle has completion tracking feature that can be activated for each course. This option allows teachers to control students' progress. For each completed activity or use resource award is a badge. Moodle Badges Basic is a library of badges that can be given as a reward for acquired knowledge, skills, and learning experience. Moodle Badges are designed to work in Moodle 2.1, Moodle 2.4 and Moodle 2.7+ on web, safari and iPhone, and also can work with Mozilla Open Badges (Moodle).
- **Leaderboard.** Ranking Block is a plug-in for Moodle that allows add points to students based on their points. Ranking block enables individual activities and awarding points to students based on scores and criteria chosen. Leaderboards are visible to all users and they are a way of showing recognition from other learners. Students can see where they stand and compare their results and achievements with others. Leaderboards encourage competition between learners and motivate them to be more active participants in the learning process.

In addition Moodle supports Conditional activities to control access to learning content on a granular level. Teachers can set multiple activity completion and participation which must be met by the students in order to access the activities. Conditional activities are a tool that creates personalized, non-linear

[illegible] elements that must be met by the students in order to [illegible] in Moodle. [illegible] there are different ways to implement gamification in Moodle [illegible] data processing and tracking of students' progress [illegible]

6. Conclusion: E-learning is suitable for easy and effective implementation of gamification. [illegible] techniques and mechanisms can be implemented in the learning process [illegible] students' motivation to complete [illegible] students in a friendly competitive environment with other learners. Gamification is an effective approach to make positive change in attitude, behavior and outlook towards learning, to improve their motivation and engagement. The results of the [illegible] students' results and understanding of the educational content and create conditions for an effective learning process.

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CONTENTS

Chapter - 5

TECHNOPHOBIA AMONG TEACHERS: ISSUES AND CHALLENGES

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Introduction

The word Technophobia is derived from Greek 'Techne' meaning "art, skill or craft" and 'phobos' meaning "fear or aversion". This term first appeared in the American psychiatrist Craig Brod's book "Technostress: The Human Cost of the Computer Revolution", which was published in 1984.

Technophobia is the constant and persistent fear of technology and, in greater depth, is defined as "the feeling of severe anxiety associated with using anything technologically advanced".

An irrational or disproportionate fear of technology especially advanced digital technology including computers, robots, and artificial intelligence. A dislike of or aversion to new or changing technology. Fear or dislike of advanced technology or complex devices and especially computers. It is quite often seen that some people though having good academic achievement do hesitate to use even commonly used android or smart phones. It would not be that easy for them and seldom have they enjoyed operating it. Some people feel it not their cup of tea in operating computers programmed with updated software. A number of people find it difficult to deal with technology and gadgets. Teachers and Teacher Educators are not exceptional to this. Some people are mostly seen with extreme fear of technology. Technical gadgets, technical environment and are called 'technophobic'. Technophobia is known to affect many people around the world. It is a highly studied phobia, since, it was determined that many teachers, including those in highly

developed countries, refused to use technological aids to teach their students owing to the severe fear of technology.

'Technophobia' is the opposite of 'Technophilia'. Technophobia is a condition where the person is so much or less with technology that s/he might even want to change the world with it or one is for combating any kind of problems in the institution or society at large.

Technophobia is not necessarily a mental illness towards technology and its application in day to day life. But it is perceived as an extreme and irrational fear towards the same. In general usage, the term is concerned with an irrational fear of computers, robots, artificial intelligence, on-line or virtual transactions, techno-centric curriculum transaction and other such applications which seem advanced in scientific thought. The root cause for this would be, fear of science and technology reflected in irrational resistance by teachers in in educational institutions especially in rural contexts.

Studies have revealed that even today most of the teachers in rural and semi-urban educational institutions are found to be technophobic to varied degrees. At the same time it's not considered an extreme avoidance of computers as people understand it. Technophobia is an outward hesitation or aversion of people towards new technologies, especially cloud technology, mobile applications, the use of Internet, coding and such related applications. Having more of technophobic teachers is indeed becoming a huge problem today in many of the upcoming schools and colleges as online / virtual education is gradually becoming popular, stretching and widening its scope and feasibility across different sectors of education and schools and teachers are not prepared for it. Added to this, many institutions in rural and semi urban contexts seldom willing to bring about technological advancement as its quite expensive and not feasible due to technical error interventions. In some of the institutions it's seen that the head of the institution or academic director, are found to be techno-phobic and they refuse to adopt new technologies with

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an attitude of resistance to technological changes. This has resulted in loss of academic growth of students as well the professional competence of teachers not to techno-based curriculum transaction. It only has led to techno-stagnation with a sense of lethargy that is simply left untreated and debilitated.

In this context it's indeed essential to understand what technophobia is, and how could it be overcome, so that newer technologies can be adopted in educational institutions without fearing them. Of course, this is not going to happen overnight and will take time, but this needs continued efforts of developing a positive attitude with a sense of elevated confidence among teachers and teacher educators.

Causes of Technophobia

Technophobia can be caused due to general anxiety or fear about science or mathematical problems. People often feel intimidated by these subjects and are hence likelier to show computer anxiety.

Symptoms of Technophobia

According to Larry Rosen, a pioneer researcher and a psychologist at the University of California, there seem to be three categories of technophobic people.

- **Uncomfortable technophobes**: are those people who do not master new technologies, use them but are not comfortable doing so
- **Cognitive technophobes**: use them but with fear, as they feel they are not fully capable.
- **Anxious technophobes**: it is considered pathological and the person experiences an irrational fear towards the use of new technologies.

Technophobes believe that, when faced with complex computers, telephone systems, or even Automatic Teller Machines, they might have to deal with complex set of instructions. The average individual usually finds these sets of

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instructions easy to follow, but in case of Technophobia, the person simply freezes. S/he is so panic-stricken at the thought of using the device that they suffer a mild panic attack. Often they realize that their fears are without any basis, but they are completely powerless over it. Needless to say, this fear of technology is highly limiting and can affect the individual's day-to-day life.

Technophobia is different from most other specific phobias in that, the phobic is mainly ignorant and does not welcome change. They simply do not understand technology as a result of which they not only fear it but also shun it. Many tend to hate devices, computers and gadgets simply because they are not used to them.

There are different manifestations of Technophobia. Hence the intensity of the symptoms may vary from person to person. However the symptoms of technophobia are presented in relation to the use of technological devices or anything related to new technologies. The most common symptoms of fear of technology include

- Self-doubt and avoidance behavior.
- The phobic might constantly think about technology and about using it.
- The more sedate symptoms include reluctance or refusal to use computers or preferring to withdraw cash from the human cashier in banks rather than using the "hole-in-the-wall" ATM machine.
- Resisting any automatic processes
- Being unwilling to change to new computer software systems
- Criticizing technological changes and implementations
- Saying: "I have managed for so long without technology, I can get by"...

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- The physical symptoms of Technophobia include feeling breathless, dizzy, having heart palpitations, becoming angry, losing control, feeling detached from reality, being unable to think or speak clearly etc.
- Feelings of fear and, in extreme cases, panic
- Anxiety and anguish
- Palpitations
- Restlessness
- Sweating
- Shortness of breath and hot flushes
- Tremors
- Lack of concentration
- Avoidance of the feared stimulus

Measures to overcome Technophobia:

Technophobic teachers shall know that it is neither a disease nor a reflection of their intelligence. They need not be afraid or embarrassed about it. It is obvious that technophobia is not a recognized mental illness but just an absurd aversion towards all things technological. This may vary from avoiding computers and smartphones to consuming medicines made out of genetic engineering. This may be a minor issue of self-limiting that may affect the person so much academically to the extent of becoming outdated and unfit to work in a techno-centric academic institutions. It's a serious issue that needs mental health treatment.

The following measures can be of great help in this regard.

Ventilation: Talk therapy with trained therapists or even through classrooms and forums can also help one give vent to feelings of self-doubt. Teachers suffering from this phobia shall share ideas, information and knowledge by first admitting to their phobia.

Mentoring: Younger generation teachers can provide sustained support and help the senior teachers with conventional attitude suffering from this phobia. They can act as guides and mentors to help the Technophobe teacher to overcome his/her fear of technology.

Willing Exposure: Gradual, systematic and focused exposure to technological gadgets and their application in day to day academic transactions can also help teachers to overcome Technophobia.

Self-help: Self-help consists of self-advising that there is nothing wrong with using technology and that the person can start increasing the frequency of technology usage in everyday life little by little. There are a lot of self-help techniques that can actually work. Teachers need to find out what is best for them. If they feel that their aversion towards technology is irrational and that it must be paid attention to, they have already reached a certain level of insight. This insight can gradually push them out of comfort zones and find ways of gaining techno-competence to a minimum required level that can be boosted up through continued efforts and regular application. They can visit a number of online sites that can provide them basic knowledge and ideas, they can do google search for free or paid, menu driven and user friendly versions of latest applications and even they can learn through u tube.

Support groups / Peer groups: When even counselling will not help, teachers may seek the help of support groups. Support groups can be colleagues and teachers of community in network who may also be suffering from the same issue or on the extreme side, may be hyper techno-centric. By identifying and shooting support groups, teachers can understand what others are doing to overcome technophobia and imbibe the same techniques. It works on cooperative principle.

Psychotherapy is very effective as shown by many researches, and generally cognitive behavioural therapy is used, which employs different techniques.

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Counseling: Counseling can be used if self-help techniques are of very meager impact. Counselors may not teach or train teachers with techno-centric applications. They only help them gain clarity about their state of mind and advise what could be the best thing to do to overcome techno-fear. Counselors may validate teachers fear, attitude, and emotions, and assess their mind set so as to reveal why they are avoiding technology though it is obviously harming their academic and professional growth.

Cognitive behavior therapy: When simple counseling or support / peer groups do not have any significant effect, one may need professional help from a psychotherapist. Psychotherapists often use cognitive behavior therapy to change the thought pattern that might be causing the fear. They also gradually introduce the teachers to the causative stimulus and help them to reduce anxiety, fear and stress regarding learning and usage of technology in day today academic endeavors.

Psychodynamic therapy: Psychotherapists sometimes can directly treat the underlying cause, which usually is a past traumatic incident that would be the root cause of the form of technophobia in the person. Addressing the past trauma helps in treating anxiety or fear and help the client to overcome technophobia. This involves repeated discussions focusing on the past negative experiences that led to developing the phobia.

Conclusions

New technologies have burst into all sectors of human life. Computers, tablets or smartphones, smart boards etc. allow us to be connected to the digital world all through the day. This has altered our way of relating to others and to the environment and, in many cases, this has had a positive influence on our quality of life, because they facilitate greater access to information and provide us with new professional and leisure opportunities. At the same time it is found to cause techno-physiological disorders with hormonal imbalances. Experts have been warning us for some time about the risks of their misuse.

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Technophobia may cause loss of jobs, bad financial situations, stress, anxiety and a general sense of unpleasantness in the work place. Hence this condition has to be addressed at the earliest and better in the beginning of the teaching career.

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Thoughts and Practices in Education

Editor: H.N.Narasingappa

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Dr. H.N.Narasingappa

VISMAYA PRAKASHANA
MYSORE

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ಪ್ರಕಾಶಕರು
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VISMAYAPRAKASHANA

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TECHAER COMPETENCE

What makes teachers competent to teach? What factors are involved?

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Competence is a fundamental and ethical principle in any profession, and especially in teaching. Nobody disputes the idea that professionals of any kind should be competent. Every code of ethics exhorts us to be competent, but they do not tell us what competence is. Think about your own college career: Which professors did you consider good (competent), and why? A teacher needs to possess various types of inter-related "competencies" with respect to:

a) Research (Discovery of knowledge)

b) Teaching (Dissemination of knowledge) and

c) Extension (Application of knowledge)

Then only he or she can fulfill the needs of the society and meet the expectations of large student community by being a 'functional' teacher.

Concept of Teacher Competence:

'Competence' is nothing more than an improved modern term applied to an ancient 'Human value'. It's the right way of doing things, the right way to live and work in association and co-operation with others. In other words it is a, "Desired quality of job performance". In the context of education or teaching, it refers to the criteria that determine teacher effectiveness.

Definitions of Competence:

a) "Teacher competence includes right attitude, knowledge, aptitude and skills, and other teacher related characteristics" (Hawkins, 1956)

b) "Teacher behaviors that produce intended effects" (Biddle, 1964)

c) "The ability of a teacher manifested through a set of interclassroom teacher's behaviors which is a result of interaction between the process and product variables of teaching within a social setting" (Rama, 1979)

The main qualities required for a teacher to become functional and competent are:

a) Enthusiasm, b) Fluency, c) Industry, d) Neatness, e) Originality, f) Adaptability, & g) Thrift.

(DPEP News letter, 1999)

Teaching can be defined as a set of observable teacher behaviours that facilitate pupil learning and "teaching competence" means an effective performance of all the observable teacher behaviours that bring about desired pupil outcomes.

Applied to teachers; competency includes the right way of conveying units of knowledge, application and skills to the pupil-teachers. The right way includes knowledge of content as well as the processes, methods and means of conveying them in an interesting way, involving the activities of pupil-teachers. In short, a competent teacher-educator makes the teaching-learning process a joyful experience for pre-service teachers and also for herself / himself.

Any kind of games will have three components: (a) the subject matter or content of the game, (b) the mechanics (rules, etc.) and (c) the "dynamics," kind of what it feels like to play the game.

Let's adapt this demarcation to teaching itself.

The Content component means that professors should be upto the topics (e.g., neuropsychology) and skills (communication, crit-

[illegible] thinking they're teaching. Here students may say that good teachers "know their stuff."

The Mechanics component means pedagogical skills (e.g., ability to communicate knowledge, use of technology). Students may say that a professor "has a way with words," or "gets me excited even when I'm tired."

Finally, dynamics refers to the atmosphere of the classroom, including the willingness of students to take risks and how students interact with each other. Students may say that good professors create a safe, fun, and inspirational climate.

There's no formula for how high teachers need to be on each of these dimensions, or whether being high on one means they can be low on another and still be competent. For example, we've all heard "That teacher really knows his stuff—but no one can understand a thing he says!" Of course, some professors are better for some learners. I'm not a big fan a learning styles, because I think students should develop all their ways of learning. But it is the case that some students react better to some professors—at least for a while.

Traditionally, it was the first component—knowledge—that was the primary or only way competence was thought of in higher education. Professors had knowledge that students didn't. Now, however, it could be argued that knowledge is the least important component, because so much knowledge is available in so many formats. It could be that in the future the best (paid?) professors will be those who can teach thinking and interpersonal skills—because students can't look them up on the web!

Teachers should have a full package—amazing knowledge, a wonderful attitude, and an effective teaching style, very good classroom dynamics and excellent pedagogic skills associated with teacher proactive learning techniques.

Classification of Teacher Competencies:

1) Classroom competencies

2) Competencies related to administration and management

3) Competencies related to institution, colleagues, students, parents and society
4) Competencies related to content and curriculum
5) Motivational and value based competencies.

Repertoire of teaching competencies:

1. Knowledge of the subject matter
2. Planning of lessons including teaching strategies, learning aids and classroom organization.
3. Motivating learning groups. Presentation and communication skills- lecturing, explaining, eliciting responses, questioning, discussing, dramatizing, reading, demonstrating, using AV aids etc.
4. Evaluation—Formative & Summative, diagnosis of learning difficulties, encouraging evaluative discussions etc.
5. Total classroom management and discipline.

In addition to the teaching competence, various other competencies required for a functional teacher educator to bring about a desirable and constructive modification in pre-service teachers and teaching community are:

a) Institution-related competencies:

1) Development of positive attitude towards college & Profession.
2) Administration and management
3) Inter-school relationship
4) Image building and Morale building

b) Pupil-related competencies:

1) Identification of pupil talents and nurturing them.
2) Identifying the individual differences
3) Identifying their Needs and interests
4) Developing non-cognitive skills
5) Counseling & Guidance

c) Community-related competencies:

1) Awareness building
2) Ensure people participation
3) Resource mobilization & utilisation

d) Motivational competencies:

Motivating the head of the institution, colleagues, pre-service teachers, parents, Management committee and community people.

e) Value-based competencies:

1) Playing an ethical role model
2) Developing values among students-teachers.

These competencies do not result from possession of great amount of knowledge. It must become functionally operative at the appropriate time for an appropriate cause. Both content knowledge and pedagogical skills must be integrated into a pattern of desirable teacher educator behaviours to serve a useful purpose i. e, to contribute highly competent and functional teachers to the society.

MHRD

ಸಾರ್ವತ್ರಿಕ ಶಿಕ್ಷಣ ಅಭಿಯಾನ

ಜಿಲ್ಲಾ ಶಿಕ್ಷಣ ಮತ್ತು ತರಬೇತಿ ಸಂಸ್ಥೆ
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ಉಪನ್ಯಾಸಕರು,

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Dr. H.V. VAMADEVAPPA – An Illustration for THINK BEYOND YOU REACH & REACH BEYOND YOU THINK

© Dr. H. N. VISHWANATH

University Grants Commission has prescribed three dimensions with respect to professional accountability of a teacher which is to be fulfilled with utmost intellectual contributions to become a Complete Teacher - Paripoorna Shikshaka. They are:

1. Creation of new knowledge (by way of Research)
2. Dissemination of Knowledge (by way of Effective teaching employing diversified methods / approaches / strategies).
3. Application of knowledge for the Community development (through Extension services)

In this context it is not an exaggeration to say that our Dr. H. V. Vamadevappa sir is a living legendary example for a complete teacher. He has been a professional teacher and teacher educator for more than three decades serving for a good cause in teacher education i.e. to build and contribute a strong, value-moulded and rational teacher community for the nation. We all know that a competent teacher will have three components, such as Knowledge, Skills and Attitude. Dr. Vamadevappa had all of them to the fullest extent and truly he was a functional teacher educator.

I still remember every moment of my association with Dr. Vamadevappa in our companionship era of more than two decades. His contribution as the chairperson or a member of any individual or group intellectual task or assignment is simply marvellous. Our association began with the preparation of content-cum-training modules titled Environmental Education for Pre-Service Teachers (EEPT). When Environmental Education was introduced into the curriculum of teacher

education to different universities of the State of Karnataka and it is still continuing with a much wider scope for mutual growth and development as professional teacher educators. We worked together for various projects of DSERT, more being Adolescence Education and Life Skill Education. I cannot forget the time we spent preparing the question banks, NTSE question papers, teachers hand books, Guides and workshop modules and even the Karnataka State Text books prepared and published by Karnataka State Text Book Committee. In fact we have spent most of our days in DSERT in one or the other projects and assignments.

He greatly fulfilled yet other three dimensions of a teacher being an excellent human being. I could even draw a pie chart in my mind on his involvement, dedication finally ending with constructive contributions. I would simply say that it is 33% + 33% + 34%. He took care of his family, gave a comfortable and highly respectful state and status for wife and children, gave his invaluable time to all of them, catalysed a productive career to children with stability in society.

He contributed immensely for the overall development of the college as both teacher and administrator. College reached several milestones during his regime as the principal. Beyond his family and institutions, He also extended his contributions for the community development by being the executive member of many Governmental and Non-Governmental organisations.

Many of us know that he has a wider open window (He knows what he is and others too) in his balanced personality. Whenever I see Dr. Vasudevappa, I had an evergreen question in my mind, as how is that possible to him to manage his multiple tasks and responsibilities either assigned or accepted? Everyone has only 24 hours in a day but how is that he has more than that? How is he able to manage his time in executing all that is shouldered without affecting the quality of the work or assignment?

I used to observe his participatory skills and innovative tendencies during many of the seminars, discussions, workshops and

ever conferences either as a member or participant or chairperson. I could never find him with irrelevant propositions or statements. In no moment, there was any scrap conversation. He used to be very focussed on the issue on hand or thrust area of discussion. That's how he used to be always productive both in terms of initiating new ideas/ plans and execution of the same. One thing that drew my attention was, was there any stress for him and how he used to manage that being an inevitable and integral part of any intellectual tasks or to say mounting responsibilities both administrative and academic, again both in his college and outside.

Another thing which attracted me in Dr Vamadevappa was his high level of confidence in accepting and shouldering any kind of responsibilities assigned to him. Change of work was his rest. He believed in one thing that he always think beyond what he could reach and consequently he use to reach beyond what he could think. That distinguished him from many of his contemporaries. Writing and publishing very useful books on various subjects, psychology being the most prominent, either by self or by the departments that too in series is not everybody's cup of tea, but, that was also a possibility for him. Including me there are a lot many teachers and teacher educators who studied and understood Psychology by referring books authored by Dr. Vamadevappa and enjoyed teaching the same at various levels.

Dr. Vamadevappa has been a brother to me, more than a senior colleague. As his younger brother I always wish him a great academic endeavour, never ending educational saga, much more vigour and spirit to serve the intellectual sector of the society. I wish him as well his family, a good health, wealth, peace of mind and what all they want in life. ○

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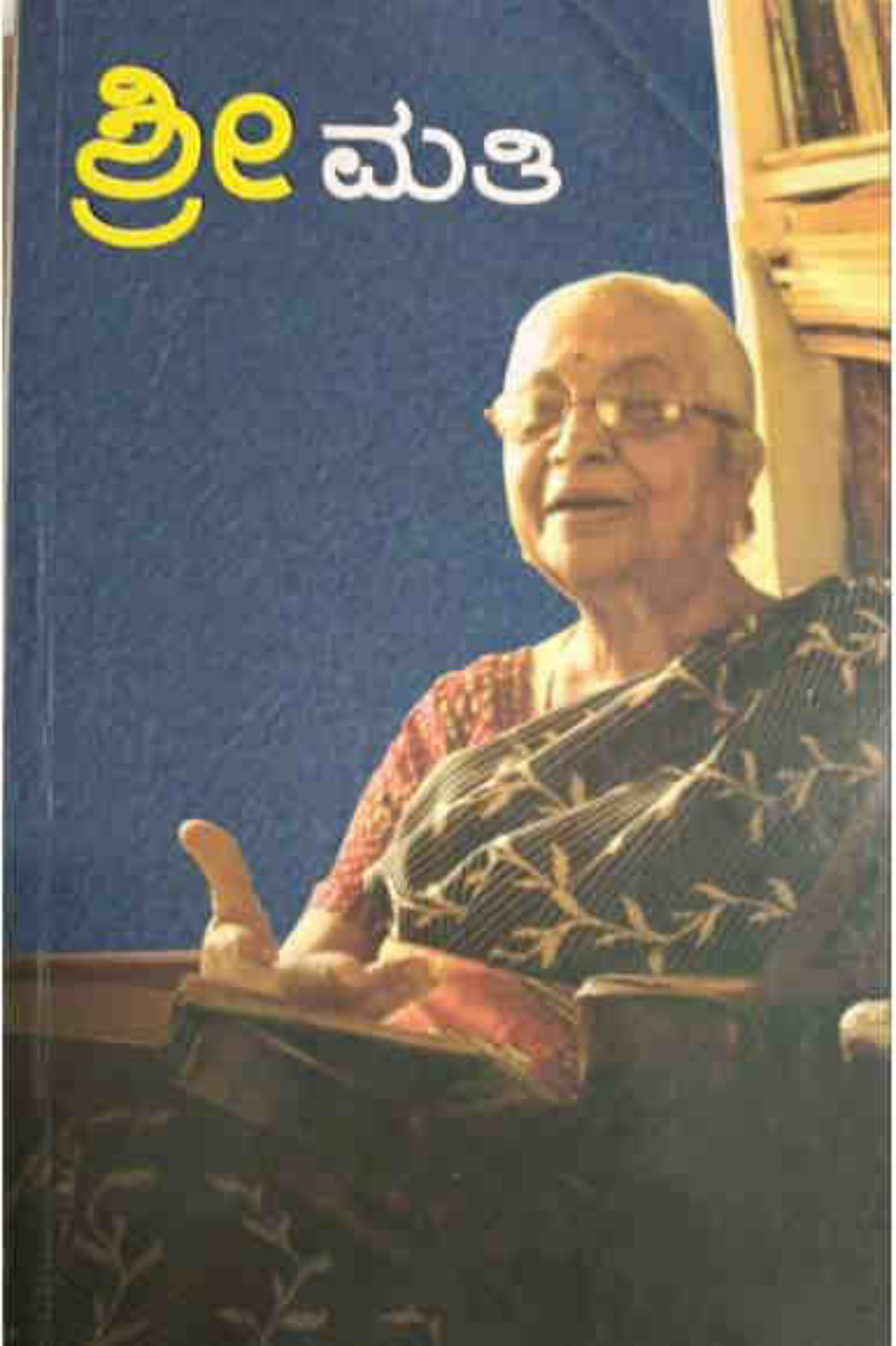

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Pull-out Scientist from student

Dr. HN VISHWANATH

A Next Gen Reflective Strategy to Teaching of Science – Constructivism

SCIENCE is an intellectual and practical activity encompassing a systematic study of the structure and behavior of the physical and natural world through observation and experiment. Science is Knowledge and Knowledge is Power. It is an open-ended exploration. It is indeed a fact that Science education plays a vital role in the overall development of a country. By and large a country depends largely on its progressive application of science and Technology in different sectors of society especially in Production and Service. This depends exclusively on the quality of teaching of science at all levels of education, especially at higher levels.

Science has two dimensions - Process and Product. In fact it is more a process than a product as the products and their quality depend on process. The Process Dimension being the endeavor of discovery or inventions by any person who applies scientific method; and Product dimension encompasses the different components of scientific knowledge such as, Concepts, Theories, Principles, Laws, Postulates, Rules,

Assumptions etc. which all constitute the body of Scientific knowledge.

It shall not be forgotten that there is a scientist in every **student**. It is through effective and meaningful science education that the hidden or suppressed scientist could be nurtured and brought out. In this context, teaching of Science gains immense significance. Engaging young students with exciting materials and experiences motivates them to learn and pursue the **sciences** throughout school education. Teaching technological literacy, critical thinking and problem-solving through science education gives students the skills and knowledge they need to succeed in school and beyond. It is high time for everyone to think about how to enhance the effectiveness of teaching of Science, how to trigger the enthusiasm and inquisitiveness among students towards learning of science, how to instil in them the mindset of scientific inquiry in the class so as to enable them become future scientists of our country... such other questions are raised.

Science pedagogy experts in recent days opine and strongly advocate an approach that is learner centered and that is true to the very nature of Science - **Constructivist Approach**. This has been strongly recommended as the most effective and meaningful approach to the teaching of Science in the document **National Curriculum Framework 2005(NCF 2005) as well National Curriculum Framework for Teacher Education 2009(NCFTE 2009).** In this context it is necessary for every teacher to know what is constructivism; Constructivism learning theory - its educational significance in the modern context; different types of constructivism; Characteristics of constructivist learning environment and how to create the same; Roles and responsibilities of Constructivist Teacher in the Constructivist Classroom and planning lessons on the principles of Constructivism by which students are Engaged in Learning, Explore new ideas, Explain in their own words about ideas revealed by them, Extend the same to apply so as to solve problems and even how to evaluate at the end? Many more such issues form the focus of the present article.

Constructivism is by and large a theory of knowledge used to explain how we know what we know. It asserts that the only tools available to a knower are the senses and it is only through these senses that an individual interacts with the environment. Individual constructs a picture of the world with these messages from the senses. In a nutshell it is the exposure and experience that one will have leads to one's own knowledge construction.

Constructivism as a learning theory reflects that,

- Learning shall be a process of constructing meaningful representations of external reality through experiences.
- An extensive emphasis shall be on the learner who is the focus of the learning process.
- All knowledge is constructed based on previous experiences.
- Learning is a process of building conceptual structures through reflection and abstraction (Von Glasersfeld, 1995);
- The focus is on concept development and deep understanding (Fosnot, 1996);
- Constructivist perspective focuses on the way the knowledge is constructed by the learner in the working memory (Khader, 2005). In this process of knowledge construction, the learner uses both incoming information from the environment and prior knowledge from long-term memory. Working memory pays attention to incoming information or materials which includes both visual and auditory working memory. It is significant to note that in constructivist view knowledge construction takes place in working memory.

The two types of constructivism are,

1. Cognitive constructivism (*Jean Piaget*) - Piaget's theory of cognitive development proposes that children cannot be '**given**' information that they immediately understand and use. Instead

children must "**construct**" their own knowledge through experiences. Experiences enable them to create **schemas** or **mental models**. Schemas are modified through **assimilation** and **accommodation**. This leads to new knowledge construction. It focuses on **individual cognitive development** through an constructed learning environment in which individuals construct knowledge **individually** based on past experiences and through adaptive process.

2. Social constructivism (Lev Vygotsky) - Construction of knowledge occurs through interaction in the social world. The development of cognitive forms occurs by means of the dialectical relationship between the individual and the social context. Cultural symbols, tools and values surface in the social processes. These processes form the basis for the emergence of the children's cognitive forms. It is within the social interaction that cultural meanings are shared within the group and then internalized by the individuals. "**The Zone of Proximal Development (ZPD)**" of Vygotsky is probably his best-known concept. It is the range of tasks too difficult for children to master alone but which can be learned with the guidance and assistance of adults or more-skilled children. Thus the lower limit of ZPD is the level of problem solving reached by the child working independently. The upper limit of ZPD is the level of additional responsibility the child can accept with the assistance of an able instructor or more capable peer.

Constructivist learning environment features.

- ✓ Students are not passive recipients of information but active "*producers of new knowledge*"
- ✓ Stresses on "*knowledge construction*" and not "knowledge reproduction"
- ✓ Provides "*multiple representations*" of reality
- ✓ Emphasizes authentic tasks in a meaningful context and not abstract instruction out of context.
- ✓ Encourages thoughtful reflection on multi-sensory experiences

$$\frac{dy}{dx} = x^{(2+1)}$$

- ✓ Enables context and content dependent knowledge construction
- ✓ Emphasizes learning and not teaching, that is student-centered top the core
- ✓ Encourages learner autonomy and initiative
- ✓ Thinks of learning as a process and not as a product, i.e., it's more a process than a product
- ✓ Encourages learner inquiry that leads to autonomous learning
- ✓ Nurtures learners natural curiosity or inquisitiveness
- ✓ Takes the learner's mental model into account on the grounds of which the self-learning experiences are designed
- ✓ Involves learners in real world situations that may lead them to extend classroom learning to real life situations at required times.
- ✓ Considers the beliefs and attitudes of the learners rather than that of teachers
- ✓ Supports co-operative learning in a conducive classroom atmosphere
- ✓ Emphasises performance and understanding when assessing learners
- ✓ The natural instincts of Enthusiasm and Inquisitiveness are nurtured with Self-Learning environment.

Constructivist Teacher in the Constructivist Classroom

- ➢ Become one of many resources that the student may learn from, the primary sources of information
- ➢ Engage students in experiences that challenge previous conceptions of their existing knowledge.
- ➢ Allow student responses to drive the lessons and seek elaborations of students' initial responses.

- Allow students some thinking time for posing questions.
- Encourage the spirit of questioning by thoughtful, open-ended questions.
- Encourage thoughtful discussions among students.
- Use cognitive terminology such as 'classify', 'analyze', and 'create' when framing tasks.
- Encourage and accept student autonomy and initiative.
- Be willing to let go of classroom control.
- Use raw data and primary sources, along with manipulative, interactive physical materials.
- Insist on clear expression from students.
- When students can communicate their understanding, then they have truly learned.
- Promote student leadership, collaboration, location of information and taking actions as a result of learning process.
- Encourage the use of alternate sources for information both from written materials and experts.
- Seek out student ideas before presenting teacher ideas.
- Encourage students to challenge each other's conceptualizations involve students in solving real-life problems.
- Extend learning beyond the class period, classroom and the school.

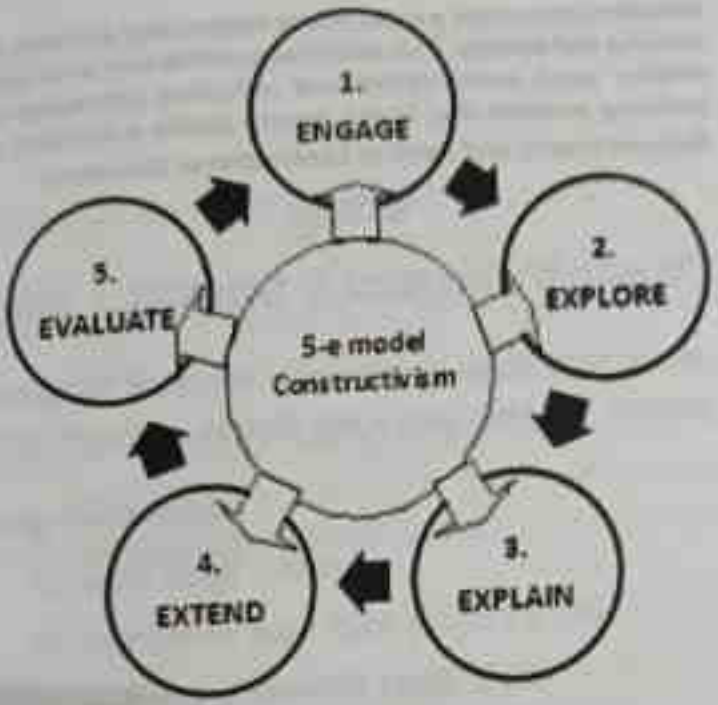
A Reflective Five E's Model based on Constructivist Approach: One of the most popular and quiet often used instructional model based on constructivist theory is Five E's model by which several instructional strategies can be evolved. It can be diagrammatically represented as follows:

Stage 1: Engage: Facilitating learning environments, learning activities and situations and focusing the minds of learners on the higher order learning tasks is the main purpose of this stage. As far as possible real life situations should be presented to engage students' attention on learning tasks. Learners can be engaged in different ways based on context: Asking open ended questions; Acting out a problematic situation; define a problem; Showing a surprising event; Noting an unexpected phenomena; Considering possible responses to questions; Presenting situations where student's perceptions vary.

Stage 2: Explore: In this stage, learners are guided to explore and find answers for the questions/issues raised during the engage stage. Teacher's role is to structure and present learning environment which facilitates learners to involve in investigative activities and provide opportunities for students to get directly involved with discovery process and construction of knowledge. Some of the exploring activities can be: Provide structured activities; Have them work in teams; Experiment with materials; Use their inquiry to drive the process; Employ problem solving strategies; Identify sequence or patterns of events; Brainstorm possible alternatives.

Stage 3: Explain: Students, who engaged in the learning activities and mutual interactions, discover their new knowledge (scientific facts, concepts, generalizations and procedures) and constructed will try to explain. Expressing this abstract knowledge through communicable form is the purpose of the third stage. New knowledge constructed by students can be expressed in different ways as follows: Explaining the constructed ideas; Constructing and explaining a model; Reviewing and criticizing solutions; Representing ideas through pictures/ graphs etc.

Stage 4: Expand: Teacher provides opportunities and guidance for students to apply the constructed knowledge (in) life situations. Students correlate the newly constructed knowledge to other related fields of knowledge which may further lead to new discoveries/new understandings. Students may apply new knowledge and skills in real life situations; transfer knowledge



and skills; share information and ideas; develop products and promote ideas; ask new questions etc.

Stage 5: Evaluate: At this stage the teacher evaluates students newly constructed knowledge as well developed conceptual understandings. Evaluation shall be diagnostic in nature. Teacher can use checklists for observation; projects and problem based learning products; achievement and attainment tests; concept/ mind mappings; portfolios assessments; performance assessments; rubrics; student interviews etc.

Conclusions: Its indeed essential that every teacher has to be scientific and especially the science teachers. They need to be reflective in their every walk of life and specially while dealing with students in classrooms. Their ethical duty is to popularize science in the Indian society that is under

transition and create a mass that is rational and scientific in thinking and actions. This would be possible only when they employ such constructive and reflective strategies of teaching science that instill among pupils a mindset of Rational Inquiry and Spirit of Exploration or Discovery.

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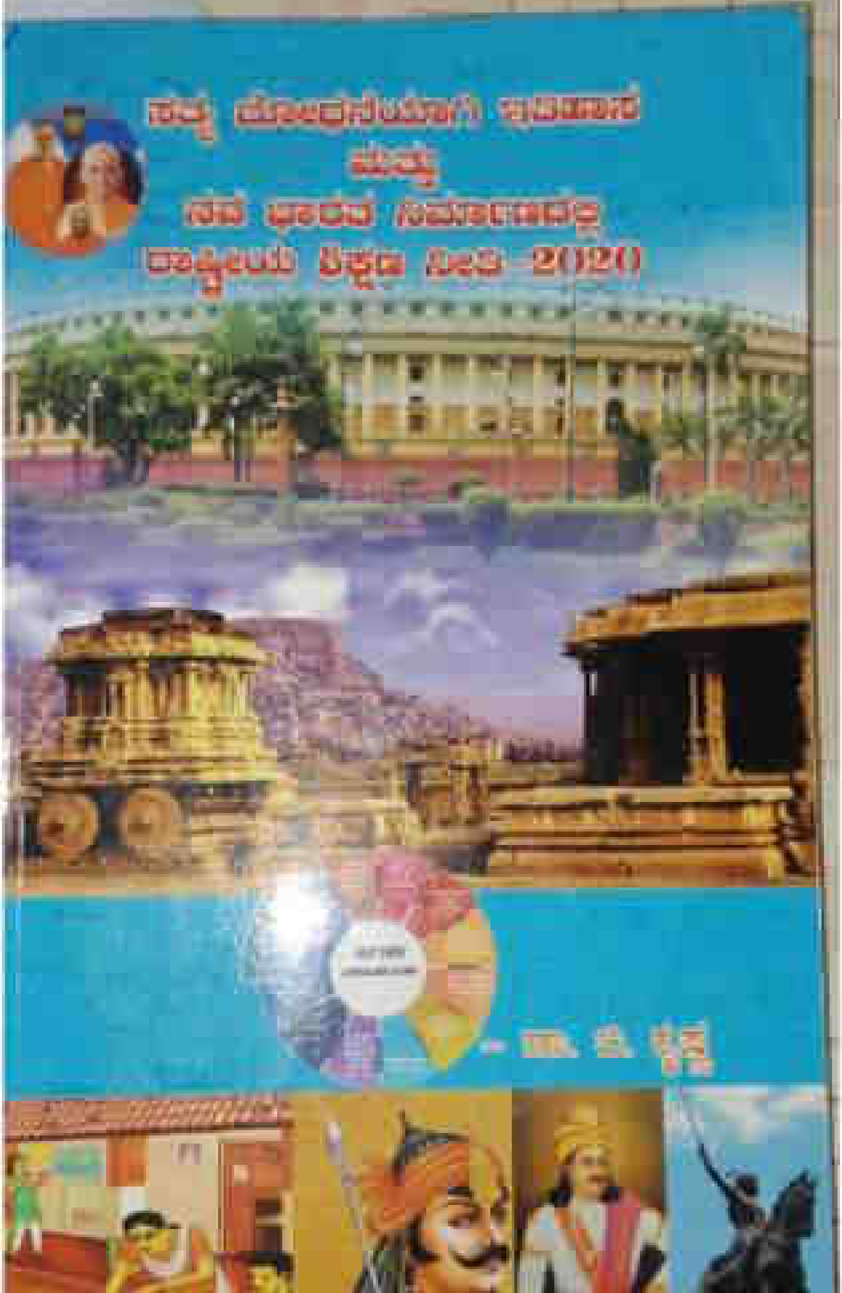

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NATIONAL EDUCATION POLICY – SCHOOL EDUCATION

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The 2020 NEP comes 34 years after the last NEP. The new policy replaces the previous National Policy on Education, 1986. The National Education Policy 2020 (NEP 2020), which was approved by the Union Cabinet of India on 29 July 2020, outlines the vision of India's new education system. The policy is a comprehensive framework for elementary education to higher education as well as vocational training in both rural and urban India. The policy aims to transform India's education system by 2040. NEP 2020 aims at 100% Gross Enrolment Ratio (GER) in school education by 2030. More than 2 crore out-of-school children will be brought back into the mainstream through an open schooling system. In other words, it is aimed at universalizing education from the pre-school to secondary level. Its vision is to enable India to become a "global knowledge superpower".

The Union Cabinet has approved NEP 2020 replaces the existing 10+2 School System with a new 5+3+3+4 School System. The NEP 2020 has reconfigured the curriculum and pedagogy of school education to 5 + 3 + 3 + 4 design with an aim to make them responsive and relevant to the developmental needs and interests of learners at different stages of their development. Besides that, the age group for the Right to Education (RTE) is now 3 to 18 years (earlier 14 years). The New Education Policy 2020 (NEP 2020) also emphasizes access, affordability, equity, quality, accountability & universalization of Early Childhood Care Education (ECCE). However, it will not be necessary to make any parallel changes to the physical infrastructure.

NEP 2020 deals with many aspects of school education that had already been addressed by the National Curriculum Framework of 2005. These include the need to move away from rote learning.

flexibility in examinations, discouraging an overdependence on textbooks and providing for overall development of children. However the objectives that are new in NEP 2020 include universal access to education and retention of all children in school until the secondary level, incorporation of pre-primary schools within the formal ambit of "school education", a multi-lingual approach to teaching and the removal of rigid demarcation between subjects and streams. Most of these have been widely discussed by academicians and policy experts.

SALIENT FEATURES OF NEP 2020: SCHOOL EDUCATION

New Pedagogical and Curricular Structure

- The existing 10+2 structure in school education will be modified with a new pedagogical and curricular restructuring of 5+3+3+4 covering ages 3-18. Currently, children in the age group of 3-6 are not covered in the 10+2 structure as Class 1 begins at age 6. In the new 5+3+3+4 structure, a strong base of Early Childhood Care and Education (ECCE) from age 3 is also included.
- Universal provisioning of quality ECCE must thus be achieved as soon as possible, within 2030, to ensure that all students entering Grade 1 are school ready. The main goal is to ensure universal access to high-quality ECCE across the country in a phased manner.
- A coordinated 'augmented national effort will be made to ensure universal access and afford opportunity to all children of the country to obtain quality holistic education-including vocational education from pre-school to Grade 12.
- The standard-setting regulatory framework and the facilitating systems for school regulation, accreditation, and governance shall be reviewed to enable improvements on the basis of the learning and experiences gained in the last decade so as to ensure that all students, particularly students from underprivileged and disadvantaged sections, shall have universal, free and compulsory access to high-quality and equitable schooling from ECCE (age 3 onwards) through higher secondary education.

ECCE- The foundation of Learning

- Universal provisioning of quality early childhood development, care, and education must be achieved as soon as possible, and no later than 2030.

- The overall aim of ECCE will be to attain optimal outcomes in the domains of physical and motor development, cognitive development, socio-emotional-ethical development, cultural-artistic development, and the development of communication and early language, literacy, and numeracy.
- A National Curricular and Pedagogical Framework for Early Childhood Care and Education (NCPFECCE) for children up to the age of 8 will be developed by NCERT.
- The numerous rich local traditions of India developed over millennia in ECCE involving art, stories, poetry, games, songs, and more, will also be suitably incorporated.
- ECCE shall be delivered through a significantly expanded and strengthened system of early childhood education institutions consisting of the following:
  - Stand-alone Anganwadis;
  - Anganwadis co-located with primary schools;
  - Pre-primary schools/sections covering at least age 5 to 6 years co-located with existing primary schools; and
  - Stand-alone Pre-schools.

All aforesaid would have specially trained workers/teachers in the curriculum and pedagogy of ECCE. Anganwadi Centers will be strengthened for universal access to ECCE. Every child prior to the age of 5 will move to a "Preparatory Class" or "Balavatika" (that is, before Class 1), which has an ECCE-qualified trained teacher.

Training of current Anganwadi workers/teachers: Those with qualifications of 10+2 and above shall be given a 6-month certificate programme in ECCE; and those with lower educational qualifications shall be given a one-year diploma programme. These programmes may run through digital/distance mode allowing teachers to acquire ECCE qualifications with minimal disruption to their current work.

ECCE curriculum: The planning and implementation of ECCE curriculum will be carried out jointly by the Ministries of HRD, Women and Child Development (WCD), Health and Family Welfare (HFW), and Tribal Affairs.

Foundational Literacy and Numeracy: An urgent & necessary prerequisite to learning

- A National Mission on Foundational Literacy and Numeracy will be set up by the Ministry of Human Resource Development (MHRD) on priority.
- All State/UT governments will prepare an implementation plan for ensuring universal foundational literacy and numeracy in all primary schools for all learners by grade 3 to be achieved by 2025.
- Teachers will be trained to impart foundational literacy and numeracy. To ensure that all students are school ready, an interim 3 month play-based school preparation module[1] for all Grade 1 students will be developed by NCERT and SCERTs.
- A national repository of high-quality resources on foundational literacy and numeracy will be made available on the Digital Infrastructure for Knowledge Sharing (DIKSHA).
- States to consider establishing innovative models to foster peer-tutoring and volunteer activities, etc. for promoting foundational literacy and numeracy.
- Public and school libraries will be significantly expanded, and digital libraries will also be established.
- A National Book Promotion Policy will be formulated.
- The nutrition and health (including mental health) of children will be addressed, through healthy meals and regular health check-ups, and health cards will be issued to monitor the same.

Reducing Dropout rates and ensuring Universal access to education at all levels

- Every school shall have adequate infrastructure support from pre-primary school to Grade 12; and Alternative and Innovative Education Centres to ensure that children of migrant laborers, and other children who are dropping out of school due to various circumstances are brought back into mainstream education.
- Achieve universal participation in school by carefully tracking students, as well as their learning levels.
- Appointing counsellors or well-trained social workers connected to schools/school complexes.

- Scope of school education will be broadened to facilitate multiple pathways to learning involving both formal and non-formal education modes.
- NIOS and State Open Schools will also offer A, B and C levels that are equivalent to Grades 3, 5, and 8 of the formal school system; secondary education programs that are equivalent to Grades 10 and 12;
- States are encouraged to develop vocational education courses/programs and adult literacy and life-enrichment programs in regional languages by establishing new/strengthening the existing State Institutes of Open Schooling (SIOS).
- The focus will be to have less emphasis on input and greater emphasis on output potential concerning desired learning outcomes.
- Efforts to involve community. Databases of literate volunteers, retired/serving/government/semi government employees, alumni, and educators will be generated for this purpose.

Restructuring School Curriculum and Pedagogy in a new 5+3+3+4

The curricular and pedagogical structure of school education: guided by a 5+3+3+4 design corresponding to the age ranges of 3-8, 8-11, 11-14, and 14-18 years, respectively. However no parallel changes to physical infrastructure will be required. This design will have.

- **Foundational Stage** (in two parts, that is, 3 years of Anganwadi/pre-school + 2 years in primary school in Grades 1-2; both together covering ages 3-8): with flexible, multilevel, play/activity-based learning and the curriculum and pedagogy of ECCE.
- **Preparatory Stage** (Grades 3-5, covering ages 8-11): with the introduction Experiential learning across the sciences, mathematics, arts, social sciences, and humanities.
- **Middle Stage** (Grades 6-8, covering ages 11-14): with a subject-oriented pedagogical and curricular style.
- **Secondary Stage** (Grades 9-12 in two phases, i.e., 9 and 10 in the first and 11 and 12 in the second, covering ages 14-18) : with greater depth, greater critical thinking, greater attention to life

aspirations, and greater flexibility and student choice of subjects, and option to exit at grade 10 and re-enter at a later stage in grade 11.

Holistic Development of Learners

- Ultimately curriculum and pedagogy reform is to move towards real understanding and learning how to learn and away from the culture of rote learning.
- Cognitive development shall not only be the aim of education, but also building character and creating holistic and well-rounded individuals equipped with the key 21st century skills such as Cooperation, Coordination, Creative thinking and Collaboration.
- Specific sets of skills and values across domains will be identified for integration and incorporation at each stage of learning, from pre-school to higher education.

Reduction in Curriculum content to enhance essential learning and Critical Thinking

- Curriculum content will be reduced in each subject to its core essentials, and make space for critical thinking and more holistic, inquiry-based, discovery-based, discussion-based, and analysis-based learning.
- The mandated content will focus on key concepts, ideas, applications, and problem-solving.
- Teaching and learning will be made more interactive.

Experiential Learning

- In all stages, experiential learning will be adopted that includes hands-on learning, arts-integrated and sports-integrated education, story-telling based pedagogy etc.
- Classroom transactions will shift towards Competency-Based Learning and Education (CBLE).
- The assessment tools are aligned with the learning outcomes, abilities, and dispositions as specified for each subject of a given class.

No hard Separation

- Students will be given increased flexibility and choice of subjects to study, particularly in secondary school – including subjects in physical education, the arts and crafts, and vocational skills.

- There will be no hard separation among 'curricular', 'extracurricular', or 'co-curricular', among 'arts', 'humanities', and 'sciences', or between 'vocational' or 'academic' streams.
- Subjects such as physical education, the arts and crafts, and vocational skills, in addition to science, humanities, and mathematics, will be incorporated throughout the school curriculum.
- Each of the four stages of school education may consider moving towards a semester or any other system that allows the inclusion of shorter modules.

Multilingualism and the Power of Language

- Home language/mother tongue/local language/regional language will be the will be the medium of instruction wherever possible, until at least Grade 5, but preferably till Grade 8 and beyond. Thereafter, the home/local language shall continue to be taught as a language wherever possible. This shall be followed by both public and private schools.
- High-quality textbooks, including in science, will be made available in home languages/mother tongue.
- All languages will be taught in an enjoyable and interactive style.
- States may enter into bilateral agreements to hire teachers from each other.
- The three-language learned by children will be the choices of States, regions, and of the students, so long as at least two of the three languages are native to India.
- Efforts to prepare high-quality bilingual textbooks and teaching-learning materials for science and mathematics, so that students are enabled to think and speak about the two subjects both in their home language/mother tongue and in English.
- Indian Sign Language (ISL) will be standardized across the country, and National and State curriculum materials developed for use by students with hearing impairment.

Curricular integration of essential Subjects, Skills, and Capacities

- Certain subjects, skills, and capacities will be emphasized in school, such as, scientific temper and evidence-based thinking; creativity and innovativeness; sense of aesthetics and art; oral and written

communication, health and nutrition; physical education, fitness, wellness, and sports; collaboration and teamwork; problem solving and logical reasoning; vocational exposure and skills; digital literacy, coding, and computational thinking; ethical and moral reasoning; etc.

- Introduction of contemporary subjects such as Artificial Intelligence, Design Thinking etc.
- Holistic Health, Organic Living, Environmental Education, Global Citizenship Education (GCED), etc. are introduced at relevant stages
- Mathematics and Computational thinking will be given emphasis throughout school years. Activities involving coding will be introduced in middle stage.
- No-Bag days will be encouraged throughout the year for various types of enrichment activities involving arts, quizzes, sports, and vocational crafts.

National Curriculum Framework for School Education(NCFSE)

A new and comprehensive National Curricular Framework for School Education, NCFSE 2020-21, will be undertaken by the NCERT. The NCFSE document shall be revised and updated once in every 5-10 years, taking into account frontline curriculum.

National Text Books with Local Content and Flavour

- All textbooks will contain the essential core materials on a national level, but at the same time contain any desired nuances and supplementary material as per local contexts and needs.
- States will prepare their own curricula which may be based on the NCFSE prepared by NCERT to the extent possible and prepare textbooks (which may be based on the NCERT textbook materials to the extent possible), incorporating State flavour and material as needed.
- Coordinated efforts, through suitable changes in curriculum and pedagogy, will be made to significantly reduce the weight of school bags and textbooks.

Knowledge of India

- This includes knowledge from ancient India to modern India as

norms, standards, and guidelines for student assessment and evaluation for all recognized school boards.

- Boards will develop further viable models of Board Exams, such as – annual/semester/modular board exams, offering all subjects, beginning with mathematics, at two levels, two parts exams or objective type and descriptive type. Guidelines will be prepared by NCERT, in consultation with SCERTS, Boards of Assessment (BOAs), and PARAKH.
- The progress card of all students for school-based assessment will be redesigned. It will be a holistic, 360-degree, multidimensional report that reflects in great detail the progress and the uniqueness of each learner in the cognitive, affective, and psychomotor domains. This will include self-assessment, peer assessment and teacher assessment.
- Teachers to be prepared for a transformation in the assessment system by the 2022-23 academic session.
- The National Testing Agency (NTA) will offer a high-quality common aptitude test, as well as specialized common subject exams in the sciences, humanities, languages, arts, and vocational subjects, at least twice every year for university entrance exams.

Support for Gifted Students with Special Talents

- The NCERT and NCTE will develop guidelines for the education of gifted children.
- B.Ed. programmes may also allow a specialization in the education of gifted children.
- Teachers will encourage students with singular interests and/or talents in the classroom by giving them appropriate enrichment materials and guidance.
- Olympiads and competitions in various subjects will be conducted across the country.
- Online apps with quizzes, competitions, assessments, enrichment materials, and online communities for shared interests will be developed as group activities.
- Schools will develop smart classrooms in a phased manner.

Efficient resourcing and effective governance through school complexes/clusters

- By 2025, innovative mechanisms will be developed by State/UT governments to group or rationalize schools, such as, school complexes to ensure optimal utilization and sharing of resources by adopting benefits of school complex. This include – improved support for children with disabilities, more topic-centered clubs and academic/sports/arts/crafts events across school complexes, sharing of teachers including use of ICT tools to conduct virtual classes, better student support, enrolment, attendance, and performance through the sharing of counsellors.
- To further enhance cooperation and positive synergy among schools, including between public and private schools, the twinning/ pairing of one public school with one private school will be adopted across the country.

Setting Standards and Accreditation for School Education

- The Department of School Education will be responsible for overall monitoring and policymaking for continual improvement.
- The educational operations and service provision for the public schooling system of the whole State will be handled by the Directorate of School Education.
- An effective quality self-regulation or accreditation system will be instituted for all stages of education including pre-school education – private, public, and philanthropic to ensure compliance with essential quality standards.
- States/UTs will set up an independent, State-wide, body called the State School Standards Authority (SSSA) which will establish a minimal set of standards. This information shall be self- disclosed and will be made available on a public website maintained by the SSSA.
- Academic matters, including academic standards and curricula in the State will be led by the SCERT (with close consultation and collaboration with the NCERT).
- The SCERT will develop a School Quality Assessment and Accreditation Framework (SQAAF) through wide consultations with all stakeholders.

- Public and private schools (except the schools that are managed-aided/controlled by the Central government) will be assessed and accredited on the same criteria, benchmarks, and processes.

Re-imagining Vocational Education

- At least 50%-of learners shall have exposure to vocational education through the school and higher education system by 2025. Beginning with vocational exposure at early ages in middle and secondary school, quality vocational education will be integrated smoothly into higher education. Every child to learn at least one vocation and exposed to several more.
- Sampling of important vocational crafts, such as carpentry, electric work, metal work, gardening, pottery making, etc., as decided by States and local communities during Grades 6-8. A 10-day bag-less period sometime during Grades 6-8 to intern with local vocational experts such as carpenters, gardeners, potters, artists, etc. Similar internship opportunities are provided to learn vocational subjects to students throughout Grades 6-12, including holiday periods.

Vocational education will be integrated in the educational offerings of all secondary schools in a phased manner over the next decade. Towards this, secondary schools will also collaborate with ITIs, polytechnics, local industry, etc. Skill labs will also be set up. Vocational courses through online mode will also be made available.

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