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Digital Pedagogy: A 21ST Century Approach of School Education

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ABSTRACT

Now a days the changing paradigm of the teaching learning process demands technology oriented learning environment. We live in the arena of digital environment i.e., digital content, digital reference materials, digitalized instruction system and digital courses which are very popular in latest scenario of the world. Technology not only makes interesting our learning environment but also reduces stress from the mind of the children. Use of technology also helps them to remember the content or topic for a long time. Now, technology should be infused into the pedagogy. Content should be taught through technology oriented pedagogy. Digital pedagogy enhances practical skills and competencies of ICT world. If we design it effectively it has many advantages. But its design is cost effective, laborious and intelligent enough. Its most effective side is that if we can design it effectively it creates most attractive and positive learning environment. But frustrating enough our secondary schools is far behind of this new approach. Teachers are less acquainted about the use of technology in the classrooms. They fail to create the attractive digital learning environment on some of the contents. The paper tries to focus the design, formation and function of digital pedagogy on the recent teaching learning contents. It also mentioned the advantages and concerning factors of digital pedagogy.

Keywords: Technology, Digital learning, Digital pedagogy, Secondary Schools, Class Content

Traditional Concept of Pedagogy

School systems need to ensure that their curricula are relevant and contain enough flexibility to accommodate different learners and different social and economic needs. They need to ensure that school buildings are in good condition. All these things are important and ultimately impact academic performance. However, none is nearly as important as the quality of teaching. There is a strong consensus that high performance in education systems is dependent on the quality of teaching'. Again, the quality of teaching is mainly based on *Pedagogies*[6].

In recent years interest in 'pedagogy' has grown to a great extent within English-language discussions of education. The stimulus has come from different directions. Scholars like Paulo Frère seeking '*pedagogy of the oppressed*' or '*critical pedagogy*'; practitioners wanting for some extra care for education via the idea of social pedagogy; and, perhaps most significantly, governments also want to equip the teachers in a most sophisticated manner by providing them a preferred pedagogy.

Pedagogy is the act of teaching, and the rationale that supports the actions that teachers take. It is what a teacher needs to know and the range of skills that a teacher needs to use in order to make effective teaching decisions[1]. Pedagogy is the discipline that deals with the theory and practice of education; it thus concerns the study and practice of how best to teach. Its aims range from the general to the narrower specifics of vocational education.

The characteristics of highly successful pedagogies are listed below[6]:

1. Effective pedagogies give serious consideration to pupil voice.
2. Effective pedagogies depend on behavior (what teachers do), knowledge and understanding (what teachers know) and beliefs (why teachers act as they do).
3. Effective pedagogies involve clear thinking about longer term learning outcomes as well as short-term goals.
4. Effective pedagogies build on pupils' prior learning and experience.
5. Effective pedagogies involve scaffolding pupil learning.
6. Effective pedagogies involve a range of techniques, including whole-class and structured group work, guided learning and individual activity.
7. Effective pedagogies focus on developing higher order thinking and meta-cognition, and make good use of dialogue and questioning in order to do so.
8. Effective pedagogies embed assessment for learning.
9. Effective pedagogies are inclusive and take the diverse needs of a range of learners, as well as matters of student equity, into account.

There are four domains of pedagogy which are shown in Fig. 1. 'Developing a shared understanding together with a common language to discuss pedagogy is the crucial first step towards transforming teaching and learning. This common understanding will ensure better continuity and progression at all stages of the learning journey. It is helpful to consider this professional knowledge as four interrelated domains'.

Rise of a New Approach: Digital Pedagogy

Pedagogy is essentially a critical thinking exercise directed at learning and teaching. Pedagogy asks us to never teach by rote: never assume the use of a podium, or an overhead projector, or desks situated in rows, or a chalkboard, or walls. Not every teacher is a pedagogue. Pedagogy is a scholarship unto itself, a study of learning and the many ways it is fuelled-in classrooms, in workshops, in studies, in writing centres-wherever learning is poised to occur[14]. The term 'digital' adds a meta-level layer which is not at all discrete. The tools that are used for learning, 'the ones that have become so ubiquitous', influences on what, where, and how to learn and how to think about learning[18].
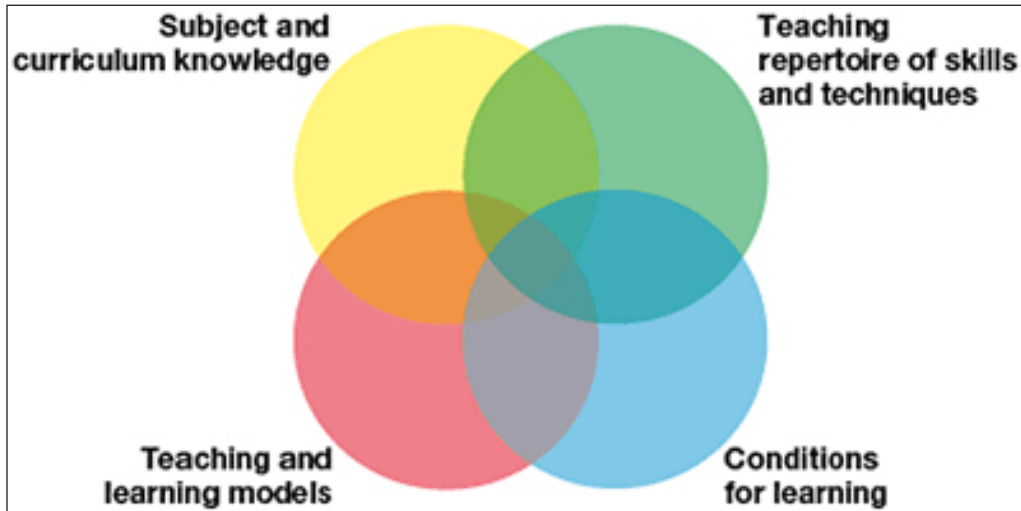
Fig. 1: Understanding a digital pedagogy

Individual digital tools have been created in order to contain the Internet. New platforms and interfaces are being developed and they are spreading like wildfires. But 'none of these tools have the value about education coded into them in advance'. Advances in digital technology have become popular and the uses of digital technology have been spread as an epidemic. We regularly hear of new developments in hardware, software, or system designs that influence how things get done in our day-to-day life. Likewise, a new kind of pedagogy has arisen as the developments of new technologies are taking place in the field of education. It's called as the *Digital Pedagogy*. Digital pedagogy has grown significantly in the last few years with the rise of various journal conferences and workshops that centred round the inclusion of more and more technological elements into the classrooms, to engage the learners through technology and various digital resources[2].

Review of related literature

Understanding the role of ICT as an enabler of social and economic growth as well as a way of working in a digital world, is both a global and local policy imperative. This imperative is driven by the survival needs of young people in a world where rapid changes in how information is created, published, stored, read, responded to and retrieved are occurring. There is a need to reframe thinking about the use of ICT in education, to focus on the purpose of the profession in the knowledge economy, learning needs and pedagogies rather than tools, functions and how ICT can be added to outdated pedagogies In grounding the use of ICT in the needs and experiences of students, learning can move beyond a focus on content, to explicitly building and deepening new knowledge through collaboration, communication, creativity, innovation, and critical thinking[10].

Digital pedagogies move beyond using ICT for efficiency, motivation and effectiveness to adding value to society and the economy by enabling the creation, distribution, sharing and application of knowledge to complex problems encountered in real world situations of work and life. It is our contention that it is possible to create better approaches to learning through digital pedagogies that alter the curriculum

and organization of teaching and learning to reflect changes in how knowledge and understandings are created. The integration and application of ICT to current curricula and organization of teaching and learning may well be part of a journey toward creating digital pedagogies.

The work of teachers has long been grounded and shaped according to the needs of students but framed and enacted according to teachers' beliefs about learning. Pedagogy evolves as knowledge, understanding, beliefs and goals change. The way ICT is used reflects teachers' beliefs about pedagogy which in turn relate to knowledge creation and learning[10]. What learning is in a digital world and how it occurs is reflected in new sources of knowledge, the content of knowledge and new ways of knowing[3],[10]. What ICT enables is a better approach to student learning and a change in context or purpose[9],[21]. Such transformation cannot occur without significant and meaningful reflection [5] that is grounded in the needs of students.

The exactly calculated combination of the spoken and the printed word, and still and moving pictures of the lecturing professor represents merely a small, almost minimal section of the many other pedagogical possibilities and chances. Naturally, many more new possibilities and chances that multimedia systems make available are obvious. We do not mean in this context the amazing and remarkable digital technology, which can change contents disseminated in various modes of presentation into flows of bits which means that they can all be transmitted, disseminated, stored and even integrated and processed in accordance with pedagogical aspects in exactly the same way[7]. It is in fact pedagogical aspects which lead to the combination and integration of these presentation modes. The multisensory impression can be used for presenting, recognizing, understanding, processing, testing and experimenting, or simply for repeating. Not only the spoken and the written word are combined and integrated with a pedagogical intention, but also, where this is required, image, audio and video information, animation and even virtual reality, for example in the form of three-dimensional spaces.

By the way, when carrying out experiments with multimedia in a digital learning environment it may be advantageous if the teacher has an idea of other specific pedagogical functions which this method of intensified illustration can have. It not only supports impressive presentations and, as in this case, recognition of regularity and concept formation, but it can also serve as an aid for motivation and reproduction. However, it may also be essential to avoid an abundance of illustrations, because this can in fact be counterproductive. What teachers should do is to select the critical points in a course or course unit in which the efforts required for multimedia are best placed to illustrate learning progress and the acquisition of knowledge. Once again, genuine pedagogical considerations are required[13].

There may of course be objections to the increased and intensified iconic presentation, in particular from academic teachers, possibly with an indication that "illustration" is primarily a method used in teaching in schools. The first argument we can use to counter these critics is that overhead projectors are being used increasingly in scientific lectures, including even those given to experts of the highest capacity of mind. We accept and even demand this type of visual support because the influence of television has greatly altered our visual habits. Secondly, we should remind them of Aristotle's dictum that "even the most abstract human knowledge is based on sensory perception"[22].

This digital information environment demands a new knowledge flow between content and digital connections. While the bibliographic paradigm created textbook learning, the digital information environment of today indicates the need for educators to understand information seeking and engagement within connected multimedia contexts. Computer and mobile device technology environments, social media, and ready forms of online communication drive our newly emerging knowledge ecosystems. It

is described as a new 'culture of learning', explained how much the Internet has changed the way we think about both technology and information. In this new culture of learning, information technology has become a participatory medium, giving rise to an environment that is constantly being changed and reshaped by the participation within information spaces. They argue that traditional approaches to learning are no longer capable of coping with this constantly changing world. The information environment is a technology environment, which demands adaptation. Information is also a networked resource, as "information absorption is a cultural and social process of engaging with the constantly changing world around us"[19].

To create digital pedagogies based on these needs, decisions about when to use ICT, what to use and for what purpose need to be made with in relation to theories of learning and assessment[9]. Effective learning environments supported and mediated by ICT incorporate a social constructivist approach[3],[16]. Social constructivism emphasises how meanings and understandings grow out of social encounters and that what occurs in society, and as a flow on, constructing knowledge is based on this understanding[2],[12]. From a practical perspective, social constructivist principles are challenged by the rapid development of ICT which challenges educators to build collaborative knowledge deepening learning experiences grounded and connected to the global learning environment.

No one vision of teaching and learning motivates teachers to strive for exemplary use of ICT and furthermore, discrepancies exist between advocacy and practice. This suggests that while broad principles of digital pedagogies are valuable in creating a vision for getting started or confirming pedagogical directions taken, researching actual journeys through the constraints and conflicting needs of the present towards the preferred futures could add valuable knowledge to the field of study[4]. Developing strategies to connect the future with the present through considering possibilities rather than remembering the way teaching and learning has always been done, and in doing so accepting the uncertainty of truth about teaching and learning in contemporary times[17].

In bringing together the notion that ICT is changing ways of working and living with the notion that learning is a social interactive process, new pedagogies are necessary to respond to the opportunities presented. The notion that complete knowledge cannot exist in the mind of one person is at odds with traditional teaching and learning practices and as such requires a different approach to planning learning in the digital age. Choosing what and how to learn is a shifting reality for contemporary learners and teachers that reflect the changing nature of learning in the 21st century and the challenge of creating pedagogies that make sense to students growing up in a digital world. Pedagogy continuously evolves according to the needs of students to ensure relevance and value for their life in a digital world. What is different about the current decade is the rapid increase in the pace of innovation. In decades past the knowledge and skills that teachers commenced their career was generally adequate for the life of a career in teaching, whereas now, new knowledge, teaching tools and strategies are emerging frequently during a teaching career. While knowledge and ICT will change, our capacity to reason, question, filter information, and think creatively will be tools of the pedagogue in the 21st century. The challenge for us is to adapt and transform practices as needed, knowing how, where, and when (as well as when not) to use ICT in teaching and learning.

Shaping Digital Pedagogy

'Digital Pedagogy means the application of digital technology tools and resources for the science of

teaching and learning'. At Digital Pedagogy, it is specified that the use of digital technology is differentiated from analogue or mechanical technologies. The focus is given upon the smooth adoption and effective application of all of those technologies which are being invented every year. New digital technologies are used when they make one's life better and will be able to ignore those fads which may be fun and fancy, but offer no meaningful use. The mission of digital pedagogy is to help students to identify their passion and reach their goals.

"Digital Pedagogy is a new way of working and learning with ICT to facilitate quality learning experiences for 21st Century learners. Digital pedagogies move the focus from ICT tools and skills to a way of working in a digital world. Effective digital pedagogies are based on the needs of individual students and incorporate contemporary teaching and learning strategies. It features personalised approaches, intellectual engagement, rigorous learning, connectedness to global contexts, supportive and collaborative classroom environments and connected curriculum, assessment and reporting to improve outcomes for students".

Digital Pedagogy is not about digital technologies for teaching. It is about approaching the tools from a critical pedagogical perspective. It is much about using digital tools thoughtfully so as to decide whether to use digital tools or not, and to give attention to the impact of the digital tools that are used for teaching and learning. As far as the definition is concerned, "digital pedagogy is the use of electronic elements to enhance or to change to experience of education". Digital pedagogy can be anything; it can be simple use of power point in the classrooms or taking free online education from the various companies that offer MOOCs i.e. Massive Open Online Courses; it can be any blogging assignments or the use of different kinds of social media in the classrooms[20]. It helps the students to get acquainted with digital tools to test their own ideas. So, it can be said that digital pedagogy is an attempt to use technology to change teaching and learning in various ways. In recent times, the popularity of digital pedagogy has grown super fast in the field of academics. But, digital pedagogy is often misunderstood in higher education. The advancement of online learning and instructional design brought the classrooms into the world of web and thus, all the manners of teaching, whether it is good or bad; coherent or incoherent, became digitized. Digital pedagogy is very important because it is willing to improvise, to respond to a new environment, to experiment. So, a digital pedagogue is not the teacher who teaches online, rather, he/she looks at the options, invites the students to participate and create a networked learning. There are some questions that would come to the mind of a good digital pedagogue very often. These are as follows:

1. What tools are available for the teacher and the students to work with?
2. How can improvisation occur online to reinforce learning?
3. Does digital learning ends when the course ends, or is it sustained perpetually by the online learning environment i.e. the Internet?
4. Who would be the students and where could they be found?
5. Do disciplines matter online?
6. What is the point of rote memorization when everything is available online all the time?
7. Where is a pedagogue's authority, as everything is found in Google?
8. What happens when learning is removed from the classrooms and exposed to the digital landscape entirely?

For most of the teachers, teaching begins with authority and expertise, but a digital pedagogue begins his/her teaching with inquiry and thus digital pedagogy is in much demand. To become an expert in digital

pedagogy, one needs research, experience, and openness to reach new learning activity, technology, or collaboration. It is a work of discipline if it is judged through the most playful and dynamic senses. Digital pedagogy cannot be outsourced as it is inseparable in the work of teaching and learning. It is becoming 'coterminous with critical pedagogy given the degree to which the digital can function both as a tool for an obstacle to liberation'. Digital pedagogy demands one to think about healthy relations between students and teachers. Fig. 2 shows the essential qualities as well as duties of a good pedagogue.

Fig. 2: Qualities of a good pedagogue

Characteristics of Digital Pedagogy

After the discussion about digital pedagogy, there are some characteristics of digital pedagogy that have emerged right away. They are as follows:

1. Digital pedagogy is classified as the means of using digital tools in the classrooms and engages the students in a variety of interactive learning formats.
2. Digital pedagogy keeps away the boredom and the work of learning is not be labelled as labouring towards the acquiring of knowledge.
3. It is an orientation towards the pedagogy which is not necessarily predicted on the use of digital tools.
4. It necessarily involves both the students and the teachers from traditional institutions and lifelong learners.
5. In digital pedagogy projects, short-term assignments are given, through which students are assessed based on their ability to demonstrate proficiency.
6. Digital pedagogy receives far less funding as its output is considered to be not knowledge, but student learning.

7. Digital pedagogues are really good at being resourceful and make the students do with what is available.
8. Digital pedagogy must inevitably acknowledge the ability of students to control and choices for their own learning.
9. It becomes vital to teach students not about particular tool, but about how to choose tools for their use.
10. Digital pedagogy is therefore necessarily learner-centric.

Designing the Principles for Digital Pedagogies

It may be said that evidence-based pedagogical practices is the foundation for developing design principles for digital pedagogies. According to the teachers who have achieved mastery in digital pedagogy, there are three broad principles of effective digital pedagogies are emerging as practices that make sense to students and foster learning. The Fig. 3 below highlights the close relationship between student attributes in a digital world and the principles of digital pedagogies[17].
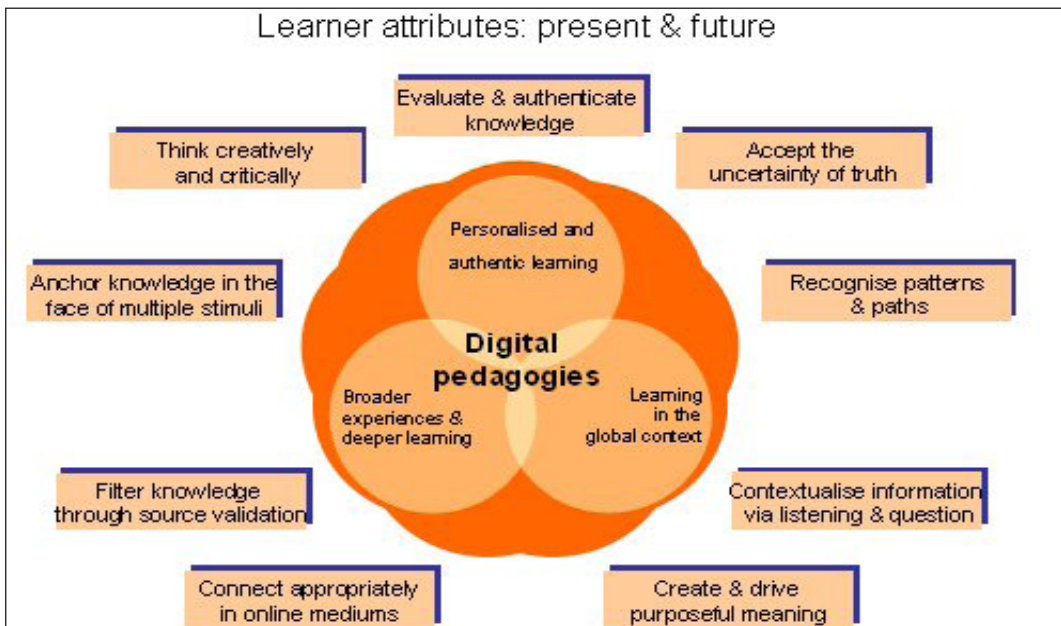

Fig. 3: Student attributes and digital pedagogies

There are three principles that are combined with a holistic approach in a rich learning environment for the students, are presented here for the outcome of a better teaching-learning experience.

Personalised and authentic learning

1. Personalised and authentic learning are the 'instrumental components' of a digital pedagogy.
2. It focuses on how ICT adds value to a learner-centred education approach and how it enables the increased personalisation through various interactions enabling different learning styles.

3. Personalised learning helps the learner to access to the curriculum.

4. The potential for autonomous learning is increased through personalised and authentic learning.

5. ICT provides the opportunities for increasing the authenticity of the information and data which the learner access, use, and are applying in the real world.

Broader experiences and deeper learning

1. It focuses on how the purposes of ICT use and how they are used.

2. Again the focus should be remained on the learning of Internet usage or curriculum above the development of ICT skills.

3. Creation of knowledge as well as the production of knowledge is of higher value than the contemporary learners.

4. It does not guarantee the establishment of a new posture in pedagogical practices.

5. Digital pedagogies recognise and exploit the role of ICT in the learning process.

Learning in the global context

1. It highlights on how ICT provides access, though it has never been done, to the world beyond the four walls of the classrooms.

2. Students work on real world projects and problems with the collaboration and interaction from the experts from different countries all over the world.

3. ICT helps the students to overcome the barriers of time, space, and safety.

In order for digital pedagogy to work, there are some helpful practices to keep in mind. There is no point in implementing something into the teaching simply for the sake of having it. The impact of a thoughtful selection of tools with a useful purpose will be greater than anything else.

Focus on Collaboration: When technologies are added, they allow students to collaborate and the teacher will add a new dimension to group work, one that will help students open up, share, and participate while building invaluable 'soft skills' for their future lives.

Design for Inclusion: While implementing technology into the teaching and as well as into the classroom, the pedagogue needs to work towards making sure each and every student can participate. The students are given time in the classroom or computer lab if they need to do digital assignments just in case they do not have a computer of their own.

Work Towards Class Participation: In the classroom, a pedagogue may use student engagement platforms to conduct lightning-round style quizzes after each lesson to better determine if the days material has been understood or not. This kind of feedback gives a positive impact to the instructor because it allows the instructor to test for overall understanding while helping reinforce what has already been learned.

Hindrances of Digital Pedagogy

While implementing a new technology or digital component into the classroom, it doesn't mean that the students will ultimately feel more connected to the subject and thus learn more. A constant digital presence can actually work against many of the things that are wanted in the students: focus, reflection, critical thinking, and contemplation (Ford, 2015).

Some disadvantages that digital pedagogy often face are :

Lack of Understanding: As the concept of digital pedagogy is relatively new, many members of a campus community may not have heard of it, may not understand what it is, or realize the full weight of the implications associated with its implementation.

Lack of Funding: Implementing digital pedagogy in the classroom requires resources. In the documentary film courses, digital video cameras, tripods, microphone kits, light kits, computers for editing, and expensive software are required. The technology limitations caused by the funding issues resulted in low number of student enrolment.

Curricular Requirements: At all levels there is a lack of understanding of how to evaluate the products of digital pedagogy. So, a pedagogue should focus on the process of creation rather than the product of the creative process. He/she should expect his/her students to fail or falter along the way and learn from those mistakes. Those flaws or mistakes do not, however, diminish the value of the process that students have completed[11].

Advantages of Digital Pedagogy

1. It is cost effective and easy to use.
2. The assessment of the work is transparent and robust.
3. Since the technology is easily available it can be quickly up graded as per requirements.
4. Constraints such as distance and time are a hurdle anymore.
5. Digital learning is more personal which makes it even better for learning creation which in return makes it effective for learner's retention and extended interest.
6. Personalisation is not only possible for digital interface but also for the storage of the data.

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