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Digital Productivity Tools as a Necessity in Education, Research and Career in the 21st Century

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ABSTRACT

This study explores the relevance-merits and demerits of digital productivity tools in education, research and career in the 21st century. Education, research and career are like a tripod leading to the socio economic advancement of a nation. Review of different literatures, observation and survey were the exploratory research design adopted to gather information. Digital productivity tools like word processors, databases, spreadsheets, desktop publishers, graphics programs, web page creators, podcast development app, and in some instances, e-mail and other communications technologies enable users to choose their own content and provide templates and functions that scaffold their presentation of content. These tools do not make learners more creative or their products better, but some research shows that these tools can encourage learners to produce more and to use their creativity. Considering the merits and demerits of digital productivity tools in education, research and career, it could be concluded that, it has played a positive role in enhancing the productivity of educators, students, employees, employers and other users and led to greater productivity, output or revenue generation. However, excessive use and over dependence hinders workflow and productivity.

Key Words: Digital tools, education, research, career, students, employees, employers

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1. INTRODUCTION

Digital Productivity Tools

The right to education is a fundamental human right but globally it is inaccessible to a larger percentage of the populace. Also, the switch from physical classrooms to online teaching and learning has come with a lot of challenges to educators, students and stakeholder in education. Many human and environmental occurrences like climate change, dwindling economy and diseases have contributed greatly to this. Technology has however, relieved this experience. Digital productivity tools are enhancing education in general, research and career advancement. Digital productivity tools maximize or extend users' ability to create products and to solve problem thereby expanding opportunities for expression and development. Productivity and creativity tools support users in constructing models, publishing, planning and organizing, mapping concepts, generating material, collecting data, developing and presenting other creative works (Paulus et al., 2013; Tsatsou, 2016; Oloyede and Ofole, 2016; Egbert and Shahrokni, 2022). In the field of e-learning, the most noted areas for growth are - Learning Experience Platforms (LXPs) and Learning Management Systems (LMS). LXPs (Artificial Intelligence-powered learning mediums) and LMS play essential role in offering a more customized and social learning environment while AR (Augmented Reality) and VR (Virtual Reality) are the next biggest e-learning sector trends. Many Universities including University of Ibadan, Nigeria adopted the LMS for educating students (Tsatsou, 2016; Pawaria, 2021).

Identifying problems, conducting extensive literature review, collecting research data, analyzing data, to writing a discipline-appropriate report for publication is a daunting task. This process is one that requires thorough effort and can consume time and money when there is a huge amount of data to analyze, especially via traditional research method (the use of paper and pen for taking notes, use of tape recorders and cameras to capture moments and so on). Digitalization through use of digital productivity and creativity tools has made research task easier from the point of observation to publication (Tsatsou, 2016). The importance of digitalization in language learning cannot be overemphasized as it was reported that learners produced content using only well-established digital tools with some individual variation. The findings imply that it could be useful to introduce new technologies into educational context both at individual and instructional levels (Bakla, 2019).

2. PRODUCTIVITY TOOLS IN EDUCATIONAL TECHNOLOGY

Different fields of research and career has productivity tools that are user specific. The use of computer systems, digital applications, software and programs has gained increasing attention, over the last decade, because they can be applied in complex research algorithms. Using these tools in the 21st century, researchers re-evaluate existing research questions and generate new ideas by identifying research gaps in previously reported works (Paulus et al, 2013). They also re-evaluate the research methodologies for more optimal research findings in subsequent works. Digital tools ease the retrieval of data from different archives and aid the systematic literature review through a correlative study approach. Digital Productivity tools in educational technology that makes working easier (like Trello, Workflowy or Air table), organize ideas into a presentable write-up and manage project through collaborative shared task ideas. Grammarly or Tranka Al construct error-free easy-to-read writings and check grammars. Using emails, video-conferencing and other academic platforms, it is easy to collaborate and keep in touch with research colleagues.

To cite sources, reference management tools such as Mendely or Endnote can be employed. While some other digital tools required in research are the plagiarism checkers like Turnitin, iThenticate, and many others which detect plagiarized contents and suggest potential collaborators to the researcher. The article or paper written is paired with the appropriate journal using the Journal finder (like the Elsevier Journal finder) (Brynjolfsson and Kahin, 2002; Tsatsou, 2016). Todoist manage jobs by allowing you to color-code tasks according to priority. Tick Tick allows users to create tasks via voice input, directly turn email into tasks and smart date parse for alerts and reminders. Files are easily shared to collaborate with colleagues and use Pomo Timer to stay focused and productive. RescueTime is a time tracking software allowing more to be done in less time. Dropbox is the safest way to share and store files, secure files and maintain privacy. Kahoot is a game based learning application to make learning enjoyable.

EssentialPIM (Personal Information Manager) lets user manage all passwords, email messages, notes, and tasks. It is an excellent tool for teachers and students as it allows for easy tracking of assignment deadlines as well as recall student ID number. Asana, a work manager, allows easy creation of agendas, assignment of tasks to different people, and monitoring of each task's progress. It streamlines and optimizes workflow, check outlines, keep tabs on deadlines, view notes, and much more. Teachers use this effectively as it facilitates group work and interaction (Pawaria, 2021). Virtual assistants are great at researching clips or other resources as it edits slides, input grades, or note-taking. EdPuzzle makes learning fun by creating personal video, or picking from YouTube, to engage students. Video can be customized by adding voice or questions. Zoom is a cloud-based video communications application for virtual video and audio conferencing, webinars, live chats, screen sharing and other collaborative capabilities. FreshGrade is a platform for collaboration between parents, students, and teachers that allows easy track able learning goals or include learning standard. Learning moments can be recorded through notes, videos, clips, and audio. It helps users to map their learning journey from their first note to the end result. Edmodo Snapshot is an assessment tool that helps educators build interactive classrooms with polls, quizzes, notes, questions, and assignments (Tsatsou, 2016, Pawaria, 2021).

Other Project management tools include ProofHub, nTask, GanttPro, Infinity, Scheduling & Calendar, Calendar Marketing Tool, HubSpot's Marketing Hub Communication & collaboration, Slack, Shift, Fleep, Chanty, Google Docs, Skype, GoToMeeting Time tracking, Toggl, Harvest, Paymo, Everhour, Hubstaff, Time Doctor Note-making, Evernote, Microsoft OneNote, Simplenote, Box notes, Dropbox paper, Google keep Email Management & Email Finder, Right Inbox, Sanebox, Unroll.me, Boomerang, Inbox, Airmail Distractions and focus, Freedom, Self-control, Focus booster, Forest, MyFitnessPal, Yoga Studio, Map My Fitness Email marketing, Litmus and many others (Kashyap, 2022).

In the sciences, chemical structure drawing and property prediction tools and software have largely replaced the manual way of drawing structures with other added advantages. The available software include BKChem, Biovia Draw, ChemSpider, MolView, CD/ChemSketch, JSME Molecule Editor, ChemBio Office, ChemDraw and many others. ChemDoodle is the only chemical drawing tool to contain superscript and subscript merge formatting in text fields to easily create atomic notations. The software automatically orients bonds in the correct directions, merge bond strokes together to give the correct image. ChemDraw is a comprehensive and powerful drawing tool used for communicating chemistry research by allowing users to draw chemical structures and reactions as well as biological objects and pathways, predict properties and spectra, convert chemical structures to IUPAC names, view 3D structures, etc.

ChemSketch is a drawing package used for drawing chemical structures including organics, organometallics, polymers and Markush structures, for calculation of molecular properties (e.g., molecular weight, density, molar refractivity, etc.), 2D and 3D structure cleaning and viewing, functionality for naming structures and prediction of logP. Marvin suite is a chemically intelligent desktop toolkit built to draw, edit, publish, render, import, and export chemical structures, converts between various chemical and graphical file formats. BKChem is a free chemical drawing program written in Python programming language that easily creates the basic structure and its links with the symbols of each element. JChemPaint is a molecule editor and file viewer for 2D chemical structures developed using Chemistry Development Kit (Tsatsou, 2016; Pawaria, 2021; Somasundaram, 2022).

There are many financial tools and accounting software used in business. Enterprise product management software is used by businesses to manage even complex projects with ease. Procure-to-Pay (P2P) Software is the most important software for business. Planergy gives large and small business owners a powerful framework for centralizing and optimizing their software environment and establishing a firm foundation for digital transformation across their entire organizations. It is ideal for expense tracking, financial planning and budgeting, managing cash flow, payroll management and bookkeeping, easy billing, inventory tracking, tax preparation, process and procurement optimization and inventory management. SPSS (Statistical Package for the Social Sciences) is a statistical software suite developed by International Business Machines (IBM) for data management, advanced analytics, multivariate analysis and business intelligence. It is used for analyzing and editing data, running statistical tests and more (Tsatsou, 2016; Pawaria, 2021). These technologies, as useful as they are have challenges, implying that digital productivity tools have merits and demerits.

3. MERITS OF DIGITAL PRODUCTIVITY TOOLS

They revolutionize the teaching, learning and research processes, and work environment, manage and organize tasks, make and organize notes and improve quality of work. Effective collaboration and individual accountability apps allow career officers to focus on what is important, for increased productivity. Effective communication is a backbone of every successful business. This is particularly true after the impact of Covid-19 pandemic, which has made robust communication tools more than a necessity in the present situation. Digital tools enable employees to work remotely. However, working away from the workplace has its own challenges, such as arranging meetings, communication gap and making sure everybody is on the same page. Digital tools allow easy performance tracking, by monitoring the progress of a project at regular intervals. Digital tools lead to job and good work-life balance.

It has the ability to synchronize with other applications for connection with everyone, everything in different ways and different levels. Many of the mobile applications are handy and lead to innovation through regular update. For instance, files used to be saved in floppy disk but flash disk are used in recent time. Digital technologies allow not only the integration of information, through Apps that access data in real time, but also increased security. In career, the digital productivity tools facilitate organizations to design, and develop their own personalized tools. The data generated by one tool may be required as input in another tool. As demands on the workforce increase, the future of work also demands streamlined solutions that make lives easier and leads to easy reporting of tasks. It enhances data security; which is of the primary concern, especially when new people, apps or tools are added to the business processes involving sharing of information and files.

Therefore, productivity tools come with a high-level of security features that reduce security risks and keep data secured, preventing it from going to the wrong hands. Most of the time, these tools require a username and password to access it. Privacy considerations are therefore important in all online activities (Tsatsou, 2016; Pawaria, 2021; Egbert and Shahrokni, 2022). Another major benefit of productivity tools is, they enable all the team members to store their data on a single platform. If some employees are working remotely, it becomes difficult to gather documents from different sources. Productivity tools make it easy for user to exchange information as it offers a single storage unit to store all the data. Images, files, documents, data sheets, presentations can be stored in a single file. All the files and documents can be accessed quickly by all the teammates, shared and allow taking necessary actions without any delay (Prajapati, 2021). Digital Tools increases productivity in research and facilitate generation of additional revenue. It support networking capabilities and opportunities, for example, Twitter and LinkedIn are good platforms for educational connectivity and collaboration.

4. DEMERITS OF DIGITAL PRODUCTIVITY TOOLS

Online platforms have been generally criticised for distraction. Digital tools can be abused or underused by the user for example by plagiarizing in an unethical manner. The digital workplace is reducing the opportunities for employees to physically communicate and integrate with their peers. Digital tools reduce man power and make people less productive. It leads to job insecurity. Many of the hardware and software used have short life spans. They have to be updated or upgraded as appropriate. Evidence has shown that working hours and time spent in online meetings is increasing, suggesting a harder but not smarter work experience. Many employees are struggling with a software overload. Also, use of social media websites for entertainment instead of educational purposes, or to promote business have negative impact. Many health hazards are associated with use of electronic gadgets for instance posture, sight and addictive tendencies. Technical malfunctions and inconsistency in quality of software are also major issues (Pawaria, 2021; Prajapati, 2021; Egbert and Shahrokni, 2022).

4.1 Measures to guide against improper use of Digital Productivity Tools

The merits of digital productivity tools outweigh its demerits. However, users must be focused and time conscious by separating work from fun, turn off notifications when working, and limit time browsing unnecessary websites. Researcher exploring the use of digital software should learn properly the mode of operation so that usage can be maximized. Overreliance on gadgets such as mobile phones, computers, GPS system could be detrimental if such gadget is lost or damaged. Digital communications tools like email, instant messaging, mobile and desk phones, dial in conference calls, video conferencing, Twitter, LinkedIn, SMS etc must be used appropriately (Tsatsou, 2016, Pawaria, 2021; Prajapati, 2021; Egbert and Shahrokni, 2022).

5. Conclusion

Digitalization is taking over. Covid 19 forced a majority of educational institutions to run courses online, making learning more accessible to students who were at a disadvantage due to geographical and social boundaries. Digital Productivity tools provide opportunities for students, teachers and professionals. All of these technologies, programs, worksheet- and puzzle-making software, and presentation packages, improve instructional and learning processes. Teacher and student products, employers and employees, researches and results of all creative processes abound on the internet.

Hence, researchers must take full advantage of the numerous digital tools available in their respective research fields to maximize time, effort, and work more efficiently. Digital productivity tools are a necessity in the 21st century research processes and career advancement. Lastly, digital productivity tools optimize educational, research or business activities if the right tools are used leading to efficient communication and collaboration, performance tracking and reporting.

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