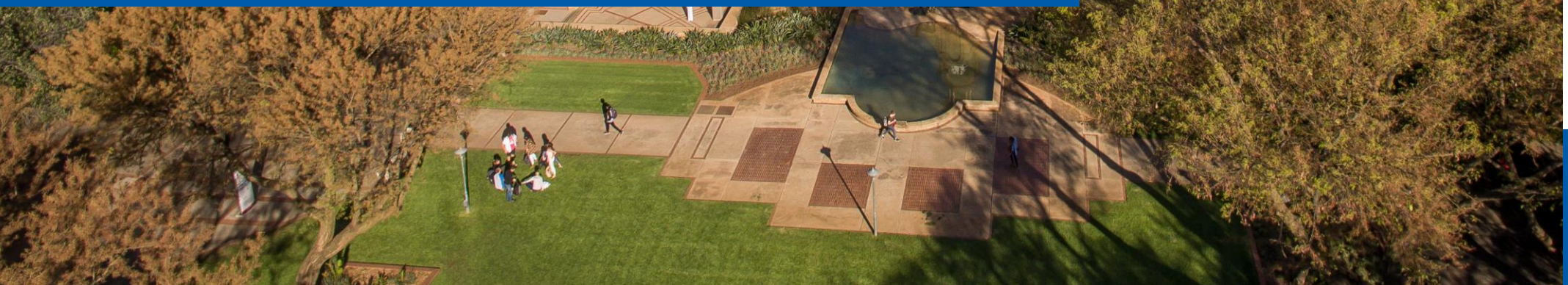
Navigating the Digital Groove

Crafting a User-Centric Odyssey for Libraries

ID van der Walt 20 Sept 2023



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Overview

- Setting the Scene
- Understanding Digital Scholarship
- The Importance of User-Centric Approach
- Crafting a User-Centric Digital Scholarship Environment
- Challenges and Solutions
- Real-World Example
- Closing

"Life is either a daring adventure or nothing at all."

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Helen Keller

Setting the Scene

An odyssey is a lengthy and adventurous journey filled with challenges and changes in fortune

- **Factors within your control:**
  - Preparation: How well you plan
  - Decision-Making: The choices you make along the way
  - Resilience: Your ability to adapt to unexpected circumstances
  - Resource Management: How you allocate and utilize resources like time, money

- **Factors outside of your control:**
  - Natural elements: Unpredictable weather patterns
  - External Events: Political instability, economic changes, or social unrest
  - Geography: Terrain, natural obstacles, and geographical features
  - Other People: Interactions with strangers, locals, or fellow travellers
  - Luck and Chance: Sometimes, random events

Loadshedding
2007 ⟶ Current

1. Disruption of Services: This can hinder research and study activities.

2. Limited Operating Hours: Academic libraries often rely on a regular schedule of operation. Load shedding can force libraries to reduce their operating hours.

3. Preservation of Electronic Resources: Sudden power cuts can pose a risk to electronic resources, including the loss of data, damage to servers, and interruption of digital preservation efforts.

4. Inadequate Lighting and Climate Control: Load shedding can lead to inadequate lighting and temperature control, which can impact the comfort and usability of library spaces, as well as the preservation of physical materials.

5. Disruption of Teaching and Learning: Academic libraries often host workshops, seminars, and group study sessions. Load shedding can disrupt these activities, affecting teaching and learning outcomes.

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Loadshedding
2007 ⟶ Current

1. Increased Awareness of Alternative Resources: Load shedding can prompt libraries to highlight and promote alternative resources like print materials, offline databases, and physical archives, encouraging a diversified approach to research.

2. Collaboration with Power Backup Providers: Libraries can collaborate with power backup providers to ensure uninterrupted services during load shedding, demonstrating adaptability and reliability to library users.

3. Fostering Resilience: Load shedding can motivate libraries to invest in backup power solutions, such as generators or solar panels, making them more resilient in the face of power interruptions.

4. Focus on Sustainable Practices: Load shedding can raise awareness about energy conservation and sustainability, encouraging libraries to adopt eco-friendly practices and reduce their carbon footprint.

5. Remote Access and Digital Initiatives: Libraries may use load shedding as an opportunity to strengthen their digital presence, expand online resources, and promote remote access to support users during power outages.

Covid 19 Pandemic 2020

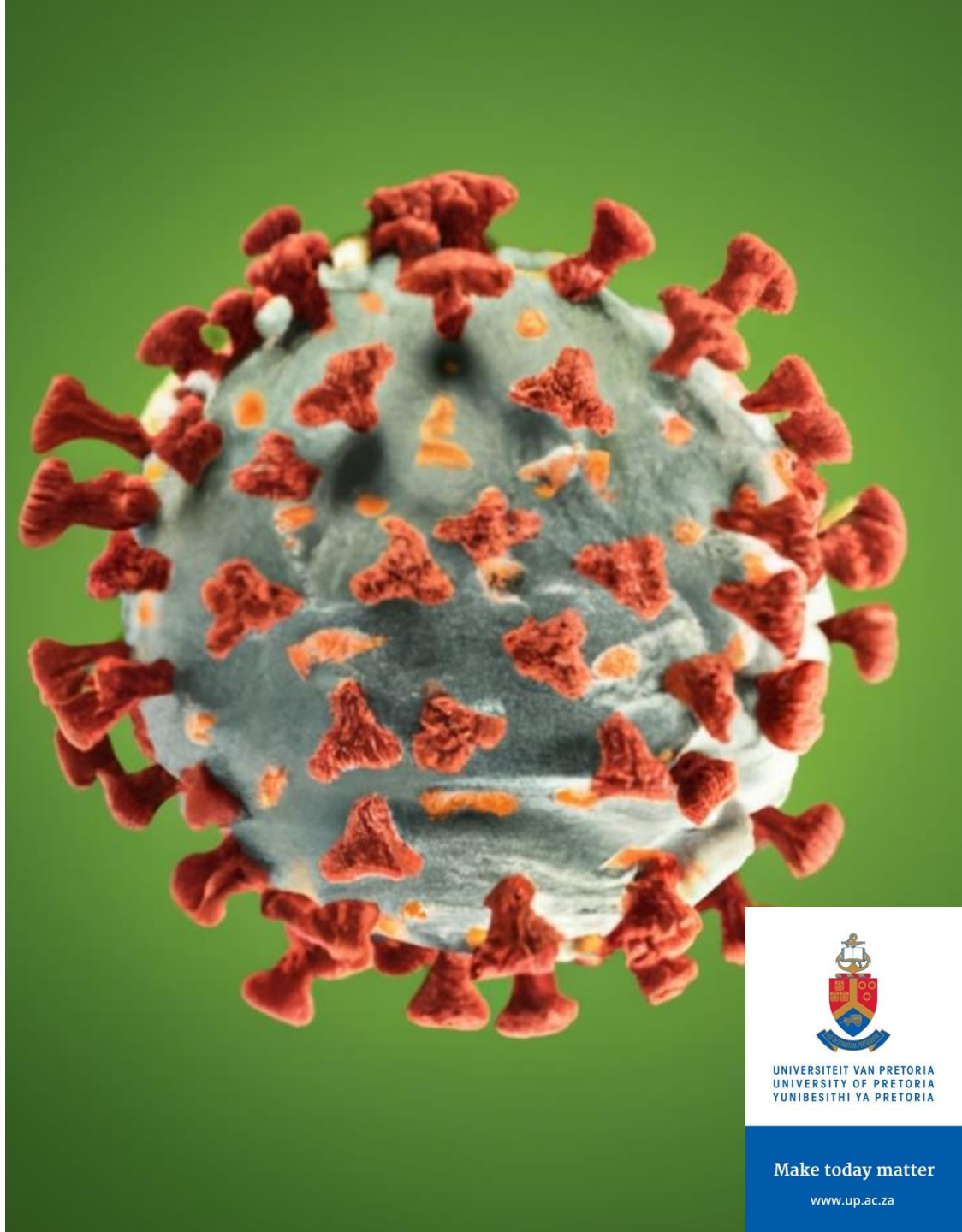
1. Physical Closure and Limited Access: Many academic libraries had to close their physical spaces or limit access to them to comply with public health guidelines, reducing the availability of physical resources and in-person services.

2. Digital Divide: The pandemic highlighted the digital divide among students and faculty, with not everyone having access to reliable internet or necessary devices for remote learning and research.

3. Budget Constraints: Economic repercussions of the pandemic led to budget cuts at many educational institutions, which impacted library budgets for acquisitions, subscriptions, and staff.

4. Altered User Behaviour: The sudden shift to remote learning altered user behaviour, with a greater demand for electronic resources and services, putting pressure on libraries to adapt quickly.

5. Mental Health and Well-being: Libraries are not just repositories of knowledge but also spaces for study and social interaction. The closure of libraries during the pandemic affected the mental health and well-being of students and staff who relied on these spaces.



Covid 19 Pandemic 2020

1. Digital Transformation: Libraries accelerated their digital transformation efforts, expanding their online collections, adopting new technologies, and enhancing their digital services, which will continue to benefit users in the long term.

2. Remote Access and Virtual Services: The pandemic forced libraries to provide robust remote access to resources and services, making it more convenient for users to access library materials and assistance from anywhere.

3. Collaboration and Resource Sharing: Libraries collaborated more closely with each other and with publishers to facilitate access to electronic resources, fostering a sense of community within the library profession.

4. Flexible Work Arrangements: The pandemic demonstrated that library staff can effectively work remotely, paving the way for more flexible work arrangements that can improve work-life balance and potentially attract a more diverse workforce.

5. Digital Literacy: The increased reliance on digital resources during the pandemic led to a heightened awareness of digital literacy. Libraries played a role in providing guidance and support for students and faculty in navigating the digital landscape.

Fees Must Fall Movement 2016

1. Service Disruption: Protests and strikes associated with the movement often disrupted the normal functioning of academic institutions, including libraries. This could lead to reduced library hours, restricted access, and interruptions in services.

2. Security and Safety: Libraries could become sites of protests, potentially posing safety and security concerns for library staff and patrons during demonstrations or occupations.

3. Resource Allocation: The library may need to allocate resources to address security concerns or manage service disruptions, diverting attention and resources away from regular library operations and services.

4. Uncertainty: The uncertainty surrounding the movement's outcomes and the potential for prolonged protests can create challenges in long-term planning and decision-making for libraries.

5. Communication and Engagement: Libraries may need to find ways to effectively communicate with students and demonstrate their support for the movement's goals while also addressing the disruption of services.

Fees Must Fall Movement 2016

1.Engagement and Support: Academic libraries have the opportunity to engage with students and support their concerns related to the high cost of education. This engagement can foster a sense of partnership and solidarity with the student body.

2.Resource Access: Libraries can play a role in making educational resources more accessible, whether by providing open educational resources (OER), advocating for reduced textbook costs, or assisting with the digitization of materials.

3.Dialogue and Discussion: Libraries can serve as safe spaces for dialogue and discussion on the issues raised by the movement, hosting forums, debates, or informational sessions to raise awareness and promote understanding.

4.Advocacy: Libraries, as integral parts of academic institutions, can advocate for changes in university policies related to tuition fees, student debt, and access to higher education.

5.Documentation and Archiving: Libraries can contribute to documenting and archiving the history of the "Fees Must Fall" movement, preserving records, documents, and other materials related to the protests and the broader context of student activism.

Economic Downturn

Credit: https://tradingeconomics.com/south-africa/currency

Economic Downturn

1.Purchasing Power: A weaker Rand reduces the purchasing power of academic libraries when acquiring new materials, such as books, journals, and electronic resources. This can strain library budgets and limit the acquisition of essential academic resources.
2.Subscription Costs: Many academic libraries subscribe to international databases, journals, and publications that are priced in USD. A weaker Rand can lead to increased subscription costs, making it harder to maintain access to critical research materials.
3.Inflation: An economic downturn can lead to inflation, which affects operating costs for libraries, including utilities, salaries, and maintenance expenses. Libraries may struggle to cover these rising costs within existing budgets.
4.Resource Access: The economic downturn may impact the ability of students and researchers to afford personal devices and internet access, affecting their ability to access digital resources and utilize library services.
5.Library Funding: Libraries may face budget cuts or reduced funding from their parent institutions as a result of economic challenges. This can impact staffing, services, and the overall quality of library offerings.

1.Open Access Initiatives: The economic downturn can encourage academic libraries to support and promote open access initiatives, making scholarly research more widely available without the need for costly subscriptions.
2.Resource Sharing: Libraries can explore collaborative resource-sharing agreements with other institutions, both domestically and internationally, to offset rising costs and maintain access to essential materials.
3.Digital Transformation: The economic downturn can accelerate the digital transformation of libraries, leading to the development of online collections, virtual services, and digital platforms that improve resource accessibility and reduce costs.
4.Advocacy for Funding: Libraries can engage in advocacy efforts to ensure that their parent institutions recognize the importance of adequately funding libraries, especially during challenging economic times.
5.Diversified Funding Sources: Libraries can seek alternative funding sources, such as grants, partnerships, or philanthropic donations, to supplement their budgets and support innovative initiatives.

Understanding Digital Scholarship

1. Definition of Digital Scholarship: Digital scholarship involves leveraging digital tools and technologies to transform traditional academic practices. It encompasses activities such as creating and sharing digital content, conducting research using online resources, and collaborating in virtual environments. This approach expands the horizons of scholarship beyond the confines of printed materials.

2. Evolution of Scholarship: The landscape of scholarship has evolved significantly with the advent of digital technology. Scholars now have access to a vast array of digital resources, including e-books, online journals, and databases. Additionally, digital scholarship includes the creation of interactive multimedia content, data visualization, and the use of social media for academic discourse. This transformation has democratized access to information and widened the scope of academic inquiry.

3. Library's Role: Libraries have transitioned into dynamic centres that support digital scholarship. They curate digital collections, offer guidance on data management and preservation, provide access to research software and tools, and facilitate workshops on digital skills. Libraries are no longer just repositories of physical books; they are essential partners in the digital scholarly process.

4. Impact on Research: Digital scholarship has had a profound impact on academic research. Scholars can now collaborate with peers worldwide in real-time, share research findings quickly through open-access platforms, and engage with a global audience. This interconnectedness has accelerated the pace of discovery and has made research more accessible and relevant to society at large.

5. Challenges & Opportunities: While digital scholarship presents numerous opportunities, it also poses challenges. Managing vast amounts of digital data, ensuring data security, navigating copyright and licensing issues, and promoting digital literacy among scholars are some of the challenges libraries and researchers face. However, these challenges also present opportunities for innovation and the development of new skills and strategies to enhance the scholarly process.

Understanding Digital Scholarship

DEPARTMENT OF LIBRARY SERVICES

SPACE TO CREATE

Innovation starts with an idea, and associated action. UP's Library Makerspace has helped many an idea leap off the page and into action.

The University of Pretoria (UP) opened the first academic Makerspace in sub-Saharan Africa in 2015 to provide an environment that all staff and students can use to not only generate ideas, but to put them into action with the aid of technology, expertise and collaboration.

The resulting environment continues to lead the way by fostering an inclusive place of productivity and creativity that promotes innovation capabilities.

As with most centres of innovation, Makerspace is constantly evolving to remain relevant in an ever-changing and demanding climate. At the core of this, is Makerspace staff, who keep abreast of various specialist fields and technologies in order to guide users in addressing their complex problems in the most efficient way, and to design and test concepts towards tangible outputs.

Critical to its success is access to novel technologies such as additive manufacturing (3D printers), internet of things (IoT) design kits and 3D scanners.

Putting ideas into action

The Makerspace team worked with UP's malaria prevention team to develop prototypes (using 3D printing and IoT kits) that can be used in the field to collect data on mosquitos more efficiently. They also collaborated with the Department of Zoology and Entomology and one of its subsidiaries, VulPro, which specialises in vulture conservation, to create an artificial egg that can be placed in the nests of vultures to accurately collect temperature, moisture levels and sit times. The data is being used to understand ideal nest conditions and ensure optimal hatching of future eggs in simulated environments.

Makerspace is a breeding ground for collaboration within the University ecosystem. "We assess where the design ideas of users reside and guide them in taking these ideas further," says Sean Kruger, coordinator of Digital Scholarship and Innovation. "There are so many functional and amazing capabilities within UP that users are not always aware of, or when to use them. The role of the Makerspace is to remain a strategic unit that develops a community that is digitally fluent for the 21st century, and provide an open, safe place for students and researchers to test their ideas and turn them into a reality."

Makerspace designed an artificial egg that can be placed in the nests of vultures to understand ideal nest conditions and ensure optimal hatching of future eggs in simulated environments.

Photo Credit: UserGI15613517 on iStock
Photo Credit: 3D-Printed vulture egg - Sean Kruger, Makerspace

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FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

COLLABORATION SOARS AT MAKERSPACE

The albatross is one of the most energy-efficient travellers in the animal kingdom. With the knowledge of Mother Nature, technology and interdisciplinary collaboration, UP researchers are finding ways to make future air travel cheaper, cleaner or faster.

Researchers: Janine Schoombie, Dr Lelanie Smith and Professor Ken Craig, Department of Mechanical and Aeronautical Engineering
Collaborator: Department of Library Services

Imagine an aircraft that automatically adapts its flight behaviour as it encounters unpredictable weather. Imagine an aircraft engineered to become more fuel-efficient because it mimics the bone structures of the most efficient birds. Such imagination is at play at the University of Pretoria (UP).

The albatross is one of the largest and most efficient flying birds in the world, using its exceptional wingspan to glide and soar across entire oceans. Its real talent lies in its ability to sense the tiniest changes in air pressure and wind direction. While some studies have studied albatross wing scans and applied this to drones, accurate measurements under varying conditions of albatross wings are currently not easily accessible.

Creativity at work

Enter UP's Library Makerspace, a collaborative space synonymous with innovation, interdisciplinary research and creativity. In discussion with Janine Schoombie of UP's Department of Mechanical and Aeronautical Engineering, the Makerspace suggested it could capture an accurate 3D digital representation of the albatross's anatomy for detailed study.

Initial scanning was performed in a static environment in the Makerspace to generate a still scan of the wings and feathers. Later, another scanning session took place inside the University's wind tunnel facilities in the Department of Mechanical and Aeronautical Engineering to compare the differences in flex and shape under flying and gliding conditions.

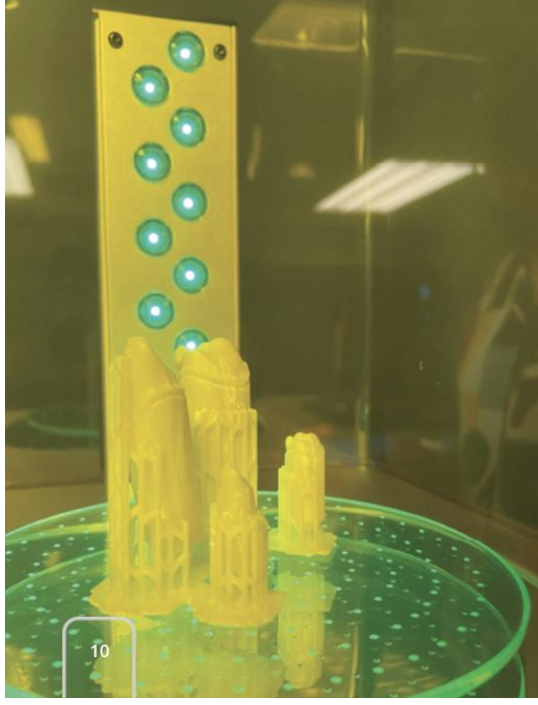
"This gives us quantitative data on the aerodynamic forces acting on the wings of this specific albatross species [the grey-headed albatross] under varying conditions," Schoombie says.

Understanding Digital Scholarship

SHAPING A FUTURE-READY AFRICA

With the help of one of the first academic "makerspaces" in the country, the University of Pretoria is expanding the ability of students to drive innovation outcomes through design thinking.

Researchers: Marita Turpin and Lizette Weilbach, Department of Informatics
Sean Kruger, Centre for the Future of Work



If a millimetre of practice is worth more than a metre of theory, imagine how far students could advance in their thinking if they could test theoretical principles against real-world challenges from the moment they set foot on campus.

A case study of first-year students in the Department of Informatics at the University of Pretoria (UP) who are working on an Internet of Things (IoT) practical assignment demonstrated the impact of design thinking. Of all design processes, design thinking is considered the best for thinking outside the box to uncover new ways to meet users' needs.

These students applied the Hasso Plattner Institute's design-thinking process, which includes the Empathise, Define, Ideate, Prototype and Test phases. By thoroughly documenting and analysing user needs during the Empathise and Test phases, the students were able to create more innovative and relevant designs.

Making space for all

To support the outcome of this, students made use of key innovation mechanisms within UP's larger ecosystem, the Makerspace. Makerspaces provide access to a range of tools and technologies to facilitate the design and creation of new products and ideas. One of the key benefits of makerspaces is their ability to enable facets within the design-thinking process.

For this specific research case, UP's Makerspace facilitated the Prototype phase, as it allowed individuals to quickly create and test multiple iterations of their ideas to identify the best solution. Makerspaces are particularly effective in facilitating this stage due to their 3D printing and IoT development kits and expertise.

Some of the final products produced by the students ranged from a Wi-Fi smart door lock to smart agriculture temperature sensors.

"By embracing and supporting innovation in new technologies, practices and methodologies, our students can add to the long-term sustainability and resilience of food systems or security within the country," says Sean Kruger, a senior lecturer at UP's Centre for the Future of Work.

"The accessibility to 3D printing and IoT technologies in makerspaces has democratised the prototyping process, allowing individuals and groups with limited resources to bring their ideas to life," Kruger says. "This has led to an increase in innovation, as more people are now able to experiment with their ideas and test them in real-world scenarios."

Furthermore, makerspaces foster a collaborative and supportive environment, enabling individuals to learn from one another and share their expertise.

"It's usually challenging to get students to do group work at this early stage of their academic life, but because they have identified a problem that they need to resolve, they are more willing to collaborate if it means that they can find the solution," he says.

This summary focuses on ways to upskill graduates of the future, and forms the basis of a **paper** that will be presented at the 22nd European Conference on Research Methodology for Business and Management Studies in September 2023 in Lisbon, Portugal.

Why this research matters

By using design thinking and leveraging innovation mechanisms within UP, this research demonstrates the potential of revolutionising how students approach problem-solving and fosters a generation of innovative thinkers that is capable of shaping a future-ready Africa. By nurturing transdisciplinary collaborations and empowering students to tackle pressing challenges, design thinking paves the way for sustainable development and positive change in Africa.

Quality Education 4

Design thinking across Africa

"In our research, we explore ways to incorporate design thinking in educational settings across Africa, emphasising its transdisciplinary nature by including diverse fields such as technology, social sciences, business, and environmental studies," explains Kruger.

Students are guided in using this technique to address challenges such as poverty, unemployment, climate change, and access to quality education and healthcare. This is because design thinking enables students to develop innovative, context-sensitive solutions to these issues through transdisciplinary collaboration.

"Our research project focuses on empowering students to develop locally relevant solutions, where the emphasis is on using a tailored approach to the unique challenges faced by the continent," Kruger says.

Enter through my phone first

Group 3 in the IoT practical assignment designed a smart door lock that responds to a cellphone message to protect against access to your home without your consent.

The Importance of User-Centric Approach

1. Definition of User-Centric Approach: A user-centric approach focuses on meeting the needs, preferences, and expectations of library users.

2. Enhancing User Satisfaction: Prioritising user satisfaction leads to increased patron loyalty and higher satisfaction levels.

3. Accessibility and Inclusivity: Ensuring accessibility for all patrons, including those with disabilities, is a key element of a user-centric approach.

4. Responsive to Changing Needs: Libraries adapt services and collections to address evolving trends and technologies through a user-centric approach.

5. Fostering Engagement and Collaboration: Actively engaging with patrons and involving them in shaping library offerings empowers users and enhances their library experience.

Crafting a User-Centric Digital Scholarship Environment
(Space)

Digital Scholarship Centre (DSC):

- Hub for innovation, collaboration, and digital scholarship initiatives.
- Equipped with state-of-the-art technology and resources.

The MakerSpace:

- Promotes hands-on learning, creativity, and experimentation.
- Fosters interdisciplinary collaboration and idea generation.

Cutting-Edge Technologies:

- Access to advanced tools for data analysis, visualization, and multimedia creation.
- Empowers scholars to explore new research methodologies.

Interdisciplinary Workshops:

- Workshops on digital skills, data management, and emerging technologies.
- Encourage skill development and knowledge sharing.

Crafting a User-Centric Digital Scholarship Environment

(Services & products)

Research Support Services:

- Expert guidance for data management, copyright, and data visualization.
- Facilitates research data sharing and preservation.

Collaborative Spaces:

- Collaborative workstations and meeting rooms for scholars and researchers.
- Encourages teamwork and interdisciplinary projects.

Virtual Resources:

- Access to digital libraries, open-access journals, and research databases.
- Expands access to scholarly resources.

Engagement with Communities:

- Outreach programs to engage with local communities and promote digital literacy.
- Partnerships with schools, non-profits, and community groups.

Crafting a User-Centric Digital Scholarship Environment

(User-Centric Values)

User Feedback Loops:

- Continuous solicitation of user feedback through surveys and user groups.
- Allows for timely adjustments and improvements.

Customized Services:

- Tailoring services to meet specific user needs.
- Personalized research assistance and resource recommendations.

Accessibility Initiatives:

- Ensuring resources and spaces are accessible to diverse user populations.
- Implementing assistive technologies and accessible formats.

User-Centric Technology Adoption:

- Evaluating and adopting technologies based on user demand and usability.
- Keeping pace with emerging trends to meet user expectations.

Measurement of Impact:

- Tracking user engagement, satisfaction, and usage metrics.
- Data-driven decision-making for optimizing user experiences.

Challenges and Solutions - Challenges

Resource Constraints:

- Limited budgets and resources can hinder the implementation of user-centric initiatives, including the development of digital tools and the maintenance of collaborative spaces.

Technological Barriers:

- Keeping up with rapidly evolving technologies can be challenging, leading to compatibility issues, cybersecurity concerns, and potential user frustration.

User Expectations and Diversity:

- Meeting diverse user expectations and needs, especially in a multicultural and multigenerational context, can be complex and requires careful planning.

Data Management and Privacy:

- Safeguarding user data and privacy is paramount but can be challenging with the growing volume of digital data generated and collected.

Digital Literacy Gaps:

- Not all users possess the same level of digital literacy, creating disparities in how they engage wi digital scholarship resources and tools.

Challenges and Solutions - Solutions

Strategic Resource Allocation:

- Prioritize funding for user-centric projects that align with the library's mission and strategic goals. Seek external grants and partnerships for additional resources.

Continuous Training and Professional Development:

- Invest in ongoing training and development for library staff to stay updated on the latest technologies and best practices, ensuring they can address technological challenges effectively.

User-Centric Design Thinking:

- Embrace user-centric design thinking principles in the development of services and spaces. Regularly gather user feedback to tailor offerings to specific user segments.

Robust Data Governance and Ethics:

- Implement strong data governance policies and ethical guidelines to protect user data and privacy. Ensure compliance with relevant data protection regulations.

Digital Literacy Programs:

- Develop digital literacy programs that cater to different user skill levels. These programs can emp users to navigate digital resources effectively and reduce literacy gaps.

Circumstances may demand a pivot or call for perseverance, but the wisdom lies in knowing which path to choose. Pivot with purpose, but never underestimate the power of perseverance. In every challenge, there is an opportunity waiting to be seized.

THANK YOU

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