



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Assessing the Larger Innovation Ecosystem in a University to Aid Academics Towards the New “Normal”

Sean Kruger



August 2021

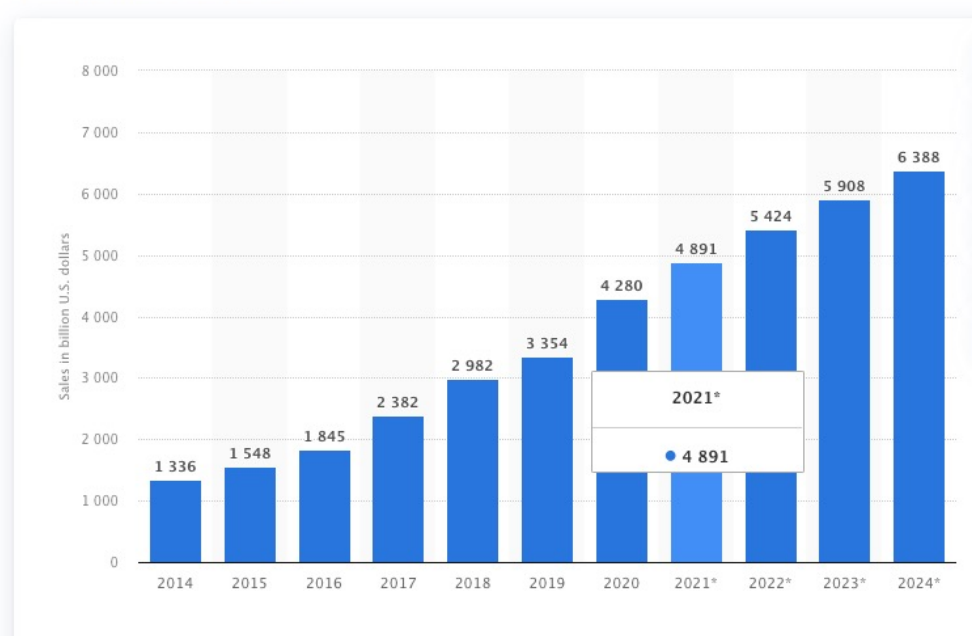
Overview

- Disruptions of COVID-19
 - Future of work (raising the need to innovate)
 - Impact on education (pressure on educators)
- University ecosystems
 - Assessing innovation support mechanisms
 - Usage case of support

Disruptions of COVID-19: Future of Work

- Millions in job losses
- Move to remote work
- Changing business (and academic) travel
- Digitisation of services
- Drive to automation using AI

Retail e-commerce sales worldwide from 2014 to 2024
(in billion U.S. dollars)



Disruptions of COVID-19: Education

- Move to online
- Various tools that needed to be learnt
- Educate for changing job profiles: Both high and low income
 - Estimated that 1 in 16 positions would have changed globally in a post COVID scenario
 - Largest hit (US and European perspective)
 - Without a higher education certification



University Ecosystems Towards Innovation

- Need for innovation
- Innovation ecosystems
 - Impacts from the pandemic
 - Channelling of funds
 - Growth strategies were moved to “survival strategies”
- Highlighted issues
 - Lack of early stage funding
 - Lack of access to digital channels
 - Lack of digital literacy

University Ecosystems: Student Support

- Inside universities there are various support mechanisms
 - Depends on TRL (Technology Readiness Level)
- Important: Innovation and an entrepreneurial spirit can originate across disciplines, and be started from various levels of education



revix

Real World	TRL 9	System operational and is proven in long-term usage
	TRL 8	Subsystem built, tested and approved
	TRL 7	Detailed design and assembly in operational environment
Simulation Environment	TRL 6	Preliminary design and prototype validation in relevant environment
	TRL 5	Conceptual design and prototype demonstration
	TRL 4	Technology demonstration in laboratory environment
Research Environment	TRL 3	Proof-of-concept based on cortical functions
	TRL 2	Technology concept or application formulated
	TRL 1	Technology research observed and reported



Concept Phase

Ideation, Research and Design

TRL 1,2 & 3



Development Phase

Technology Development

TRL 4

Decision Point

Technology validation

TRL 5 & 6

Product Development

TRL 7

Scale

TRL 8



Commercialisation Phase

Market Entry and Development

TRL 9

Digital centres, fablab, hacklab, makerspace, incubators

Accelerators, TTO, High-tech incubators, Hubs, Science Parks

Proof of concept

Technical feasibility

Start-up or scale Business

Prototype

Production prototype

Production and support

Licensing of IP

IP Protection Application

IF approved: Market technology

License or assign IP rights



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TRL 1,2 & 3



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Scale

TRL 8



Commercialisation Phase

Market Entry and Development

TRL 9

Innovation Spaces



MakerSpace
Powered by the Department of Library Services
University of Pretoria



mlab
southern africa



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a member of the dsb group



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ACCELERATING INNOVATION



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technology innovation
AGENCY



Companies and Intellectual
Property Commission
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Various corporate
sponsors

TTO



Concept Phase

Ideation, Research and Design

TRL 1,2 & 3



Development Phase

Technology Development

TRL 4

Decision Point

Technology validation

TRL 5 & 6

Product Development

TRL 7

Scale

TRL 8



Commercialisation Phase

Market Entry and Development

TRL 9

Innovation Spaces

Venture review

Marketing needs analysis

Proof of concept

Disclose discovery

Economic feasibility

Market study

Technical feasibility

Start-up or scale Business

OR

Licensing of IP

Business plan

Business formation

Marketing plan and validation

Prototype

Production prototype

IP Protection Application

IF approved: Market technology

Business growth

Marketing monitoring

Production and support

License or assign IP rights

Legend:

Business Activities

IP Protection

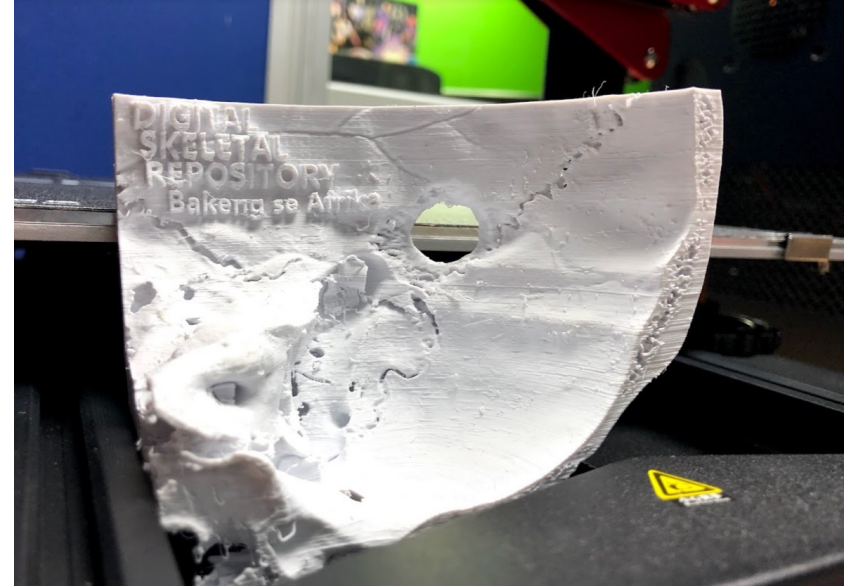
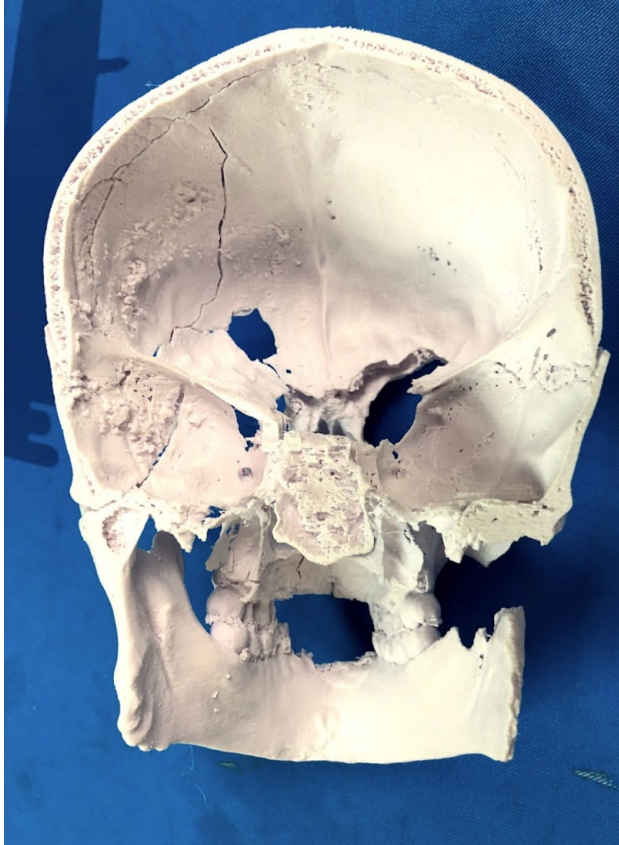
Marketing Activities

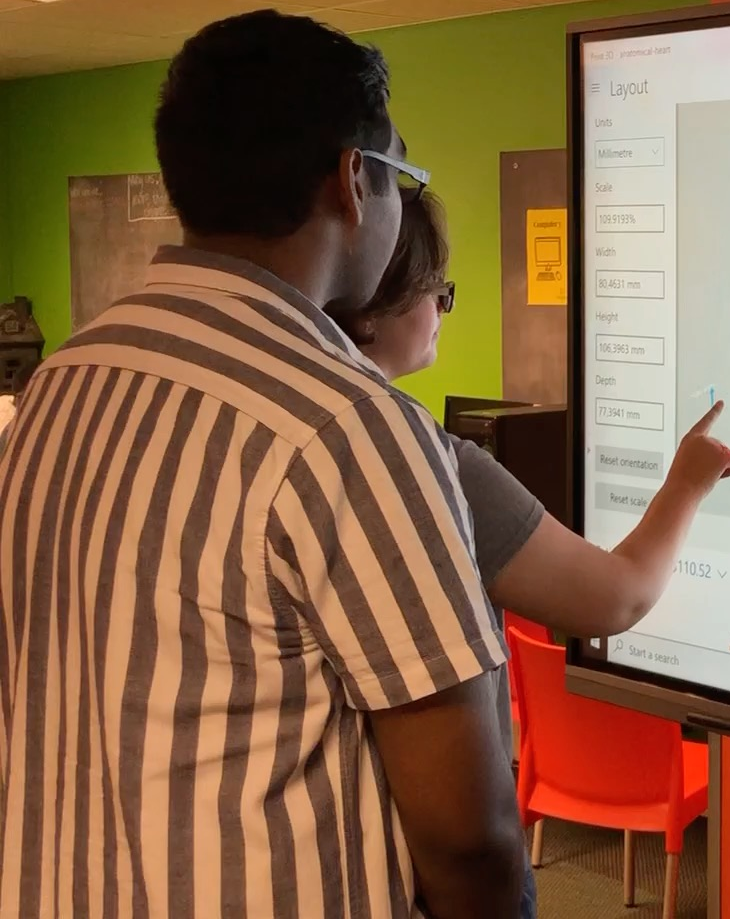
Technical

University Ecosystems: Makerspace example

- Makerspace: Ideation and physical lab
 - Can be incorporated in teaching and learning
 - Research (IP)
 - Business ideation towards spin-offs

University Ecosystems: Makerspace example





View 3D - anatomical-heart

Layout

Units
Millimetre

Scale
100.0193%

Width
80.4631 mm

Height
106.3963 mm

Depth
77.3941 mm

Reset orientation

Reset scale

110.52

Start a search

Order online

Print queue | Trello

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Print queue

Departmental Prints

- Creativity** **MakerSpace Prints**
Department
Mosquito Feeders Part 2: The Reckoning
1 2/3
- MakerHub** **Creativity** **Duplicator 8**
Duplicator 8 **MakerHub 2**
MakerHub (Gen 3)
Stress Test for Makerspace Printers
1
- Duplicator 8** **MakerSpace Prints**
Mini-Me Scares
1 2/3
- Class maker** **Not Paid** **Creativity**
Department **Cost Center**
Buttons (5h 10m)
Feb 25, 2019 2

To Print

- Not Paid** **Creativity** **Duplicator 8**
Speaker Hull (5h 5m)
2
- PAID!** **Creativity**
Heart (8h 4m)
1 0/3
- PAID!**
Clips (1h 27m)
1 0/3

Printing Now

- PAID!** **Creativity**
Drone controller protector (1h 43m)
- PAID!** **Creativity**
MiniMe Valentines (5h 18m)

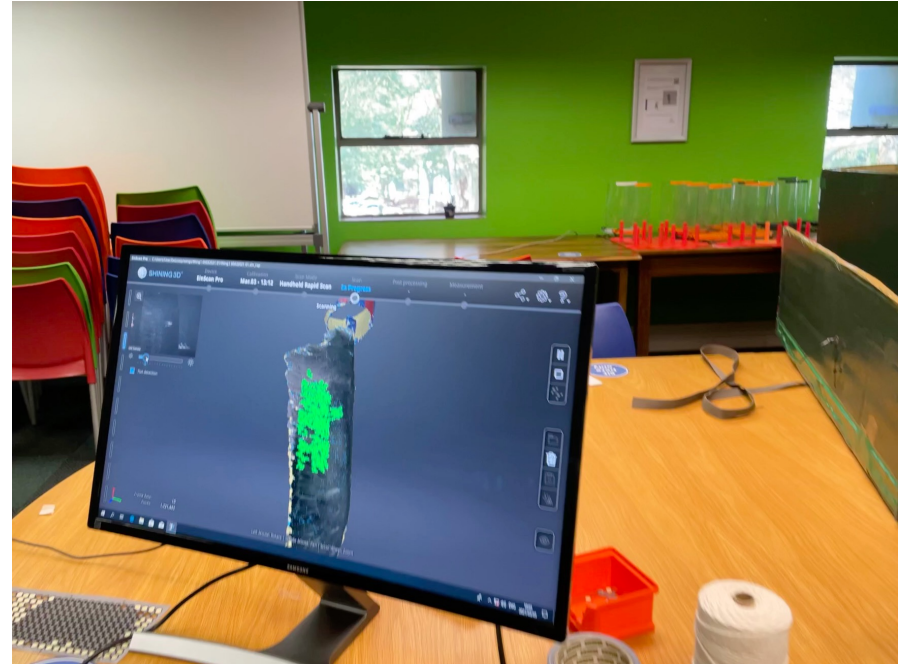
Printed

- PAID!** **Class**
Articulated Elep
- PAID!** **Class**
Halleluya Print
- PAID!** **Class**
Forensic Skull P
- PAID!** **Class**
Phone Case (1h
- PAID!** **Class**
Lowpoly Queen
- PAID!** **Class**
Rasperi Pj(5h
- PAID!** **Class**
Mykeys (1h 27

110.52

ENG 10:42 2020/02/11

University Ecosystems: Makerspace example



University Ecosystems: Makerspace example



University Ecosystems: Supporting Innovation

“Most importantly, institutions must incorporate participation in some of the programmes that are already under way as well as forums where these skills can be applied.”



Thank you

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