



Vulindlela – making new pathways

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It's a zoo in there: Reflections and case studies from collaboration and participation design with Johannesburg Zoo Edu-Centre 2011–2023

Christa van Zyl, University of Johannesburg

Abstract

Over the past twelve years, the University of Johannesburg Department of Graphic Design students have developed many feasible solutions based on human-centred and participation design principles. Implementing these design solutions to foster positive change is often problematic owing to funding and handovers; consequently, many projects remain at the conceptual stage, with few making a positive difference to the external stakeholders. Nevertheless, despite these challenges, students often produce high-end and in-depth results when working with stakeholders.

This paper uses the Johannesburg Zoo undertaking as a case study to argue that participatory design, combined with Constructivist Learning and Experiential Learning Theory, within multi-disciplinary collaborative projects, can be positioned as a sustainable, socially responsible design education model. This paper is based on a series of case studies on diverse participation design projects that UJ Department of Graphic Design has worked on with the Johannesburg Zoo since 2011. These projects have ranged from various paper toys for early childhood development (ECD) learning to potential funding initiatives, branding, mural designs, marketing, and, most recently, redesigning the zoo's education centre. The outcomes of these projects demonstrate that well-integrated participation design projects can assist in solving problems within communities, developing impactful and innovative ways to engage young minds about the zoo and its functions. The case studies highlight the creative pathways an evolving project can follow toward positive impact.

This approach has a political dimension of user empowerment and democratisation. Participation design is a method that shares design responsibility and increases design innovation.

Keywords: Collaboration, community engagement, education, human-centred design, participation design.

Introduction

The higher education landscape in South Africa has evolved to include sustainability, inclusivity, and methods for growing curriculums within digital platforms across many disciplines and courses. This paper explores participatory design in teaching and learning through a multi-disciplinary collaborative project stretching from 2011 to 2023. The paper aims to create greater awareness of this approach by describing a case study of socially responsible design education over 12 years of teaching. Within the

academic sphere of teaching and learning, new methodologies are applied and adjusted to enhance learning objectively through different enterprises, including culture and technology within the social dynamic. The Johannesburg Zoo project, utilising professional design expertise, combines a human-centred (HCD) and participatory philosophy through a user-centred approach that has the stakeholder's interest at heart. Participatory design for this project creates awareness amongst students, the Johannesburg City Parks as stakeholders, its plight, and current challenges.

In 12 years of experience with the Johannesburg Zoo Project (JZP), various problems with implementation that limit utilisation were identified. In 2011, UJ's Zoology Department requested a meeting with UJ Graphic Design (UJ GD) to encourage collaboration with the Johannesburg Zoo Education Centre. In August of the same year, members of the Department met with Nathi Mvula, the head of the Johannesburg Zoo's Education Centre. Whilst the meeting was positive, it was initially unclear how the field of graphic design could assist in solving the serious issues facing the centre, including poor maintenance and a lack of funding.

Internationally, the approach of many universities towards participatory design and human-centred design is specific and unique to their environments. Participatory design within South Africa is unique to the cultural, socio-political, and economic environment. Kang et al. (2015, p. 1) quote Sanders and Stappers, who posit that emerging design practice is moving from product-orientated to purpose-driven and user-centred to facilitate creative, collaborative outcomes. As social innovation and social design buzzwords traverse the landscape of debates and discussions within the design environment, designers are becoming an integral part of the innovation process that deals with the required complexities of social development. UJ GD's teaching and learning philosophy goal is to educate young designers to design for the greater good through co-design and participation design. The project moved from the undergraduate second-year level to the Graphic Design Honours Unit in participation design in 2018. The design thinking method combined with experiential (Kolb & Kolb 2008) and constructivist learning (Vygotsky 1978) approaches were applied to facilitate and mentor students within a dynamic environment with prominent stakeholders. Kolb and Kolb (2008, p. 43) define Experiential Learning Theory (ELT) as "a dynamic view of learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction". According to Chuang (2021, p. 6), the Constructivist Learning Theory practice allows students to self-direct and construct knowledge of the project through personal interactions: the lecturer acts as a mentor, assisting with collaboration where necessary.

The methods of participation

This paper follows a qualitative research approach, applying methods from Participatory Design (PD), Design Thinking (DT) and Social Design (SD) as research paradigms. In the *Participation Design Handbook*, Robertson and Simonsen (2013, p. 2) explain that:

Participatory design [is] a process of investigating, understanding, reflecting upon, establishing, developing, and supporting mutual learning between multiple participants in collective 'reflection-in-action'. The participants typically undertake the two principal roles of users and designers, where the designers strive to learn the realities of the users' situation. In contrast, the users strive to articulate their desired aims and learn appropriate technological means to obtain them.

During collating this paper, participatory design methods from Sanders and Stappers's (2021, p. 19) 'human-centred' approaches to design research were utilised, stipulating two primary PD methods: user-centred with the designer as author and participant, with the stakeholder as co-designer.

The UJ GD Participation Design unit incorporates a Design Thinking project structure. Brown (2008) defines design thinking as a "human-centred approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success". The DT method, because of its human-centred approach, thus complements the Participation Design for this unit.

Gregory (2003, p. 62) has worked with multidisciplinary collaborations in health informatics in Southern Africa and encourages the application of the Scandinavian participatory design tradition in South African design pedagogy. Gregory (2003, p. 62) identifies three principles of the Scandinavian approach relevant to the current study: "striving for democracy and democratisation; explicit discussions of values in design and imagined futures; and ways that conflicts and contradictions are regarded as resources in design". Within this collaboration style, the community identifies the problem. The community collectively works with the designer-researcher towards a solution (Steen 2011, p. 52). In the case of the JZP, the stakeholders identified the issues and collaborated with staff and students to achieve the desired outcome. The collaboration is ongoing and, therefore, lends an important sustainability factor to the project.

The UJ GD Honours Participation Design Unit has been taught since 2014 as a form of community engagement focused on Social Design, with an annual output of between 10 and 20 design projects for relevant stakeholders, comprising local businesses, community and university initiatives, NGOs, and governmental units. Within a constructivist and experiential framework, students apply participatory and design thinking methods to ascertain the problems these communities face and to find potential design solutions for their final submissions to the various stakeholders. Students meet stakeholders and work closely with them to design appropriate, feasible, sustainable, and preferably ecological design solutions that the stakeholders can apply at a minimal cost. These projects aim to embed collaborative co-design approaches into the departmental curricula to help foster crucial soft skills amongst students necessary to function within transdisciplinary collaborative projects, the design industry and society (Cronje & Enslin 2021, p. 307). The project also aims to create a positive social impact and provide students with guidelines to continue creating socially impactful designs after graduating. To date, 159 projects have been completed within the unit, with some success. The Johannesburg Zoo case study demonstrates the potential impact these kinds of design projects and initiatives have on effective social design practices.

Analysis

The case study approach for this paper aims to show the evolution of the PD method within a project as new methods were introduced and adjusted with every iteration of the project. This aligns with the conference's theme: applying new pathways to evolving projects.

2011, paper toys, Round 1

After the initial meetings in 2011, shortly before the project's commencement, the author purchased Louis Bou's 2010 book, *We are paper toys!* The book and consequent paper toy project proved seminal for the initial 2011 project and teaching through collaboration, design thinking, and participation.

2011 design challenge

The brief required that Second Year UJ GD students identify an animal from the zoo, study its shape, markings and form, and use its factsheet to create a double-sided folded full-colour A3 design that primary school children easily cut, fold and glue to create an animal from the zoo. Forty UJ GD second-

year students visited the Johannesburg Zoo in September to study various animals and programmes housed at the Zoo.

2011 engagement strategy

The Johannesburg Zoo staff provided the names of all animals selected to be used on the cover of the A3 brochure/booklet. In this initial collaboration, students were allowed to visit the zoo to observe and draw their chosen animal. The lecturer handled all DT, HCD, and PD processes, with limited interaction by students with the Zoo staff.

2011 design strategy

All students followed the standard five-step Design Thinking approach with this specific brief. Students 1) Empathised with children in designing and building, 2) Defined a 2D and 3D visual solution that would be feasible, 3) Ideated on the most appropriate design, 4) Prototyped the project, and 5) Tested their projects with the final submission buildup.

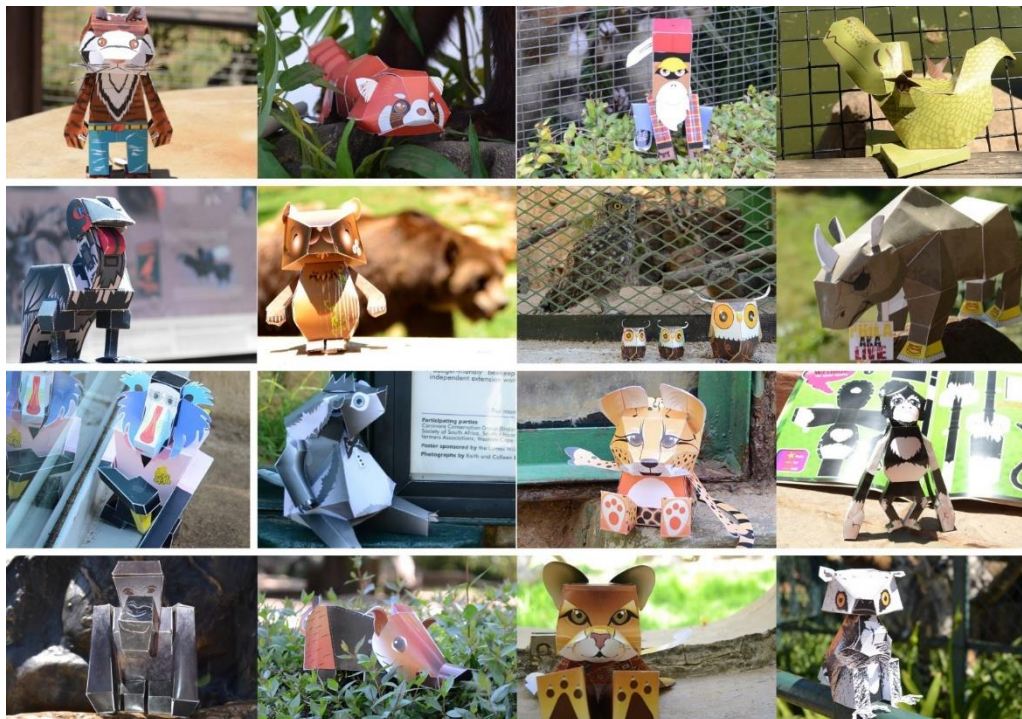


Figure 1: A few of the 2011 prototyped projects (project file)

2011 outcomes

Due to concerns about die-cut originality, little to no instructions and a lack of uniformity in the A3 designs, the project was not market-ready and required major revisions. The initial designs (Figure 1) were charming but not necessarily child-friendly. The work, however, fostered a positive sentiment towards the department and University, with the potential for future collaborations.

2015 design challenge

In 2015, UJ GD repeated the project within the Second Year of study in collaboration with UJ Department of Industrial Design. This initiative was to engage students to ensure more original templates.

2015 engagement strategy

The 2011 strategy was applied where all the students visited the zoo to observe and draw their chosen animal. The lecturers handled all DT, HCD and PD processes, and again, the students had limited interaction with the zoo staff.

2015 design strategy

All students followed the standard five-step Design Thinking approach with this brief, with tasks divided according to specialisation. Industrial Design students 1) Empathised with children in designing and building, 2) Defined a 2D and 3D visual solution based on origami that would be feasible, 3) Ideated on the most appropriate 3D template, 4) Prototyped the project, and 5) Tested their projects for their final submission. The templates and folding instructions were handed over to the Graphic Design students, who, in turn, 1) Empathised with children in designing and building, 2) Defined a 2D design style that would be feasible and attractive to children, 3) Ideated on the most appropriate character design, 4) Prototyped the project, and 5) Tested their projects with the final submission.

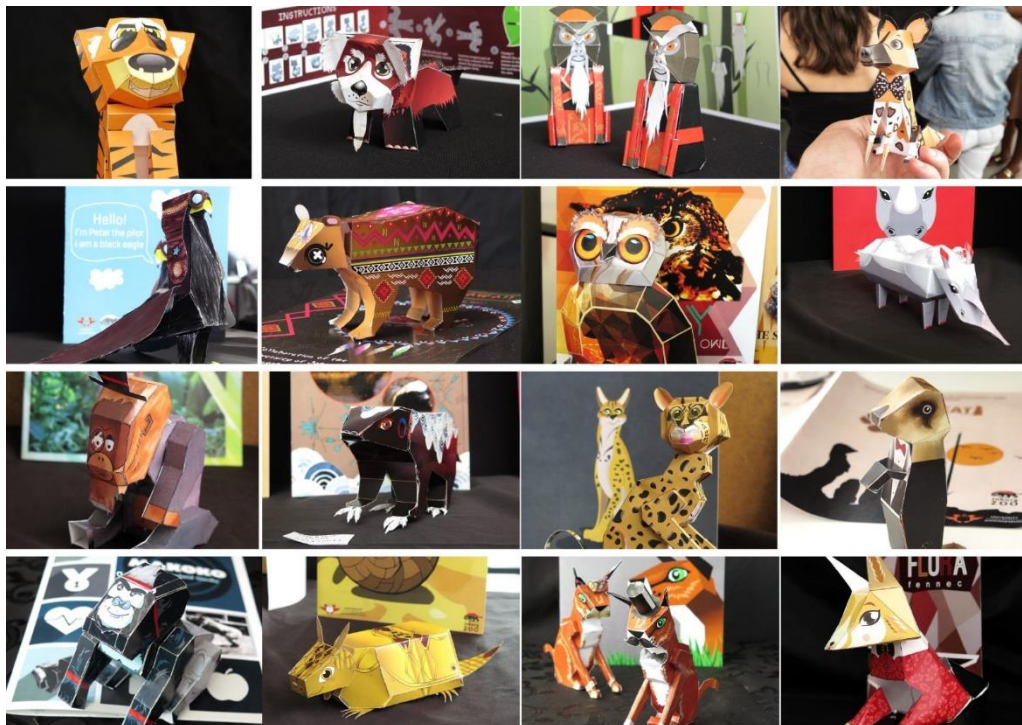


Figure 2: A few of the 2015 prototyped projects

2015–2017 outcomes

The project again fell short of a commercial standard due to overly complex original die-cuts (Figure 2). The project provided lecturers with a database of original die-cuts that could be adjusted and improved. Thus, in 2016, honours student assistants created a set template for the various animal die-cuts. In 2017, a different group of GD honours assistants created original artwork for the A3 booklet covers (Figure 3). These adjusted designs changed the project's trajectory in line with what the Paper Toys project required for implementation.



Figure 3: Diverse cover designs ranging from 2017 to 2019

2018 design challenge

In 2018, the collaboration was officially revived as a part of the Honours Participation Design Unit. The Johannesburg Zoo stakeholders and lecturers recommended that more experienced, mature students solve the templates' uniformity issue and create a stronger visual style.

2018 engagement strategy

In 2018, honours students were taught DT and PD methods with visual examples from previous PD projects. After the presentations, students met the stakeholders, having only one student pair with the Johannesburg Zoo. The student conducted a site visit, interviewed Education Centre staff, observed animals around the zoo and started prototyping. After the initial client contact, students had to complete a four-week course with a design-thinking specialist, focusing on their PD stakeholders.

2018 design strategy

The honours student refined the five most viable templates. The project was rebranded as the Zoo Buddies campaign by creating the umbrella Zoo Buddies logo. The project received greater momentum when the teaching unit timeframe was increased from three to nine weeks, giving the students more time to test and refine the project, consult directly with the stakeholders, and work on extra campaign elements. The student could focus more on creativity within the DT framework, thus improving the templates' character designs and overall desirability.

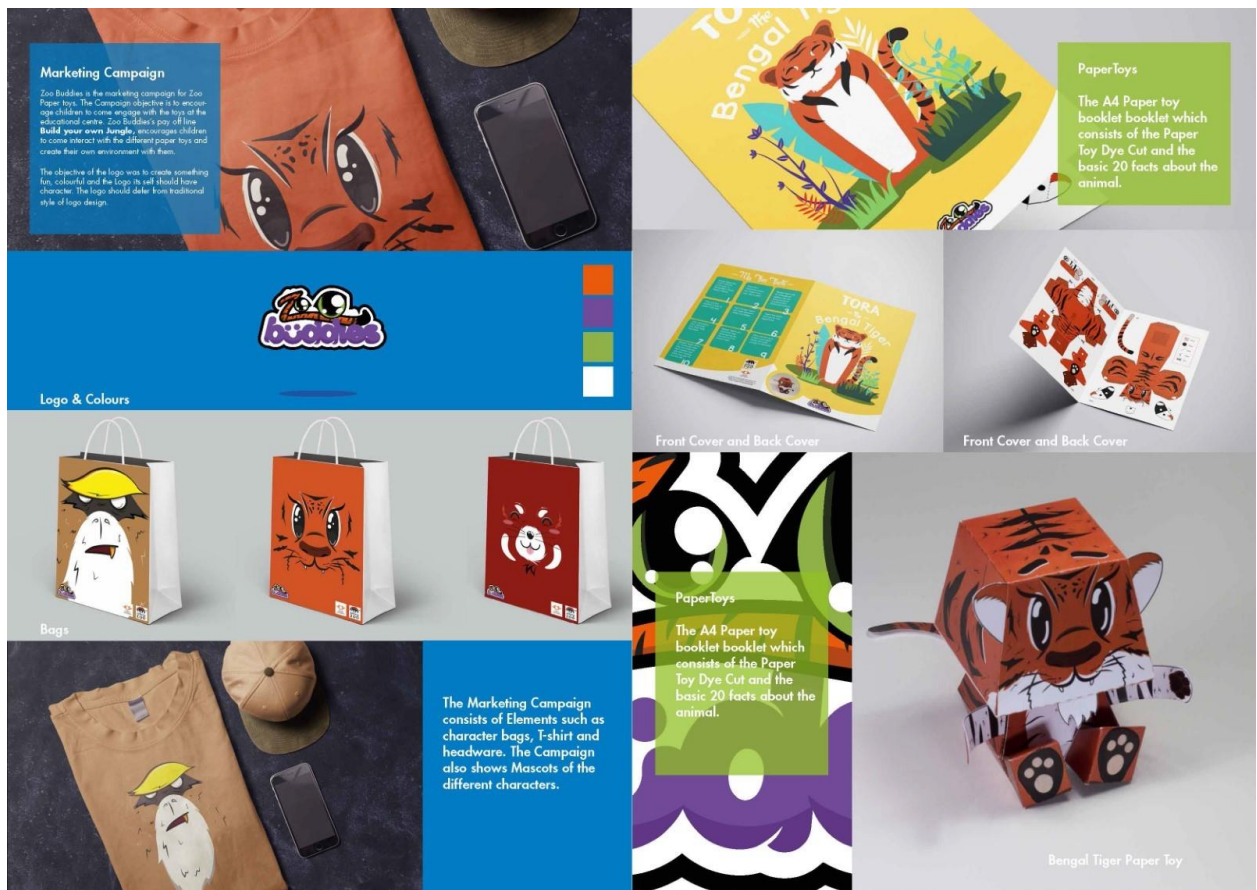


Figure 4: Excerpts from the 2018 campaign

2018 outcomes

The 2018 outcomes appeared ready for the stakeholders to implement with the visitors coming to the Zoo (Figure 4). However, due to the number of templates, the student had only created and refined five prototypes, which were too few for a campaign. The refined project also fostered a renewed drive for collaboration between UJ GD and the Zoo, leading to a second series of more diverse PD projects in 2019, moving away from a 'new' project to projects that offered support within the Zoo's existing structures. Projects included marketing the zoo's 115th birthday, a billboard (implemented), signage, mural designs, and a concept of a new Zoo club for children. During 2019, outside the UJ GD PD unit, three student assistants reviewed, built, refined and photographed 15 shortlisted template designs for the Paper Toy project. Lecturers edited and reviewed the facts per animal for the back covers of the templates.

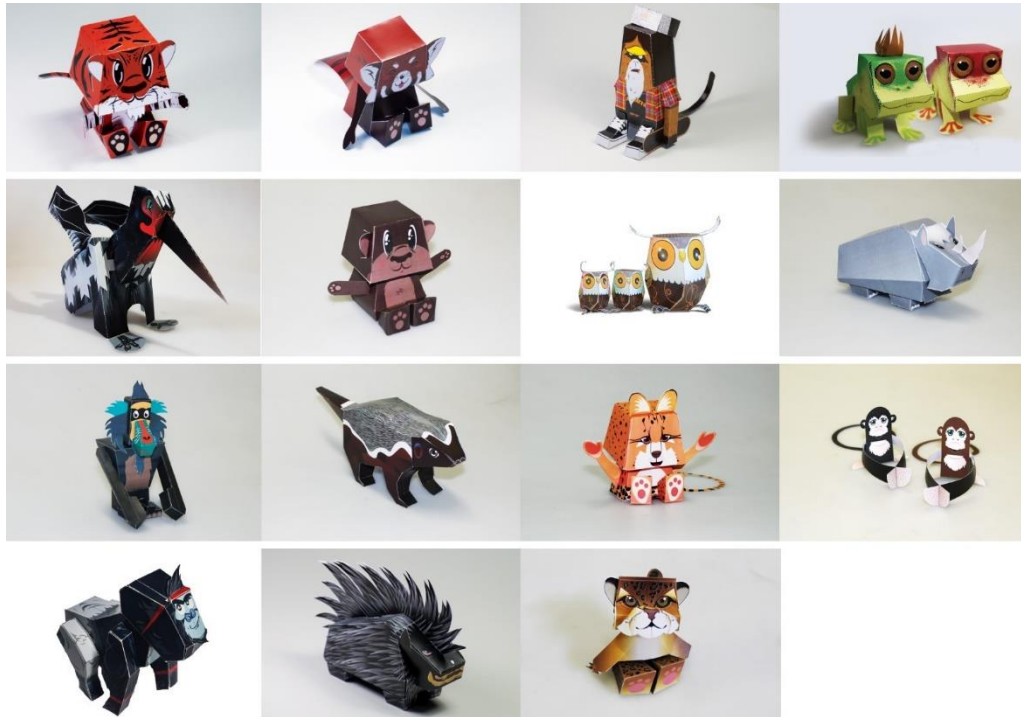


Figure 5: The final top 15 paper toys

Finally, at the end of 2019, the project received sponsorship from Johannesburg City Parks to be printed (Figure 5). In March 2020, utilising the 2018 Zoo Buddies campaign, the Johannesburg Zoo Education Centre launched the final set of 15 paper toys for sale at the Zoo's gift shop to celebrate the 115th birthday. All proceeds would go towards renovating the Edu-centre based on designs created by 2019 honours students and a parallel 2019 project that UJ Department of Interior Design had run. The Zoo Buddies launch was on Friday, 13 March, at the Zoo. Less than a week later, South Africa entered lockdown in an unprecedented and unexpected move. After almost ten years of work, the project's success appeared to yet again seemed to be beyond reach.

During the 2020 Lockdown, the Zoo's marketing team published two templates on their social media channels for children to print and build at home. All 15 templates were entered into the 2020 Loeries by UJ GD, for which the campaign won a bronze award. The boxes of printed templates were distributed to visiting schools, free of cost, with the permission of Johannesburg City Parks. Whilst this was not the intended purpose, the project did continue to keep the spotlight on the Education Centre.

2022 design challenge

In 2022, after two years of hiatus, the collaboration with the Zoo was revived. In 2022, the Education Centre briefed students on four initiatives they wished to collaborate on. The main project was revamping the Education Centre's interior through vinyl mural designs. The other three projects were Selfie murals throughout the Zoo, a Wayfinding and Events App and Educational murals and wayfinding designs for the Zoo's Temple of the Ancients.

2022 engagement strategy

Following the 2020 and 2021 lockdown hiatus, the PD unit was reduced to five weeks, with the Design Thinking unit preceding the project on an unrelated topic. In 2022, new industry specialists were

introduced into the overall project to ensure final projects were ready for implementation. The timeframe was shortened, however, the outcomes were improved due to the specialist's input.

Since 2022, the Participation Design Unit has been divided into five interconnected phases/weeks, following a modified Design Thinking Model, with one phase added at the start and two phases at the end to help establish positive relationships and assist stakeholders with implementation after the 5-week project. The Participation Design method is used throughout each stage to reflect on findings and inform decision-making. Each stage is linked to a week in the unit, with a specific goal to complete for the overall project. These stages are outlined below.

The 2022 Honours Participation Design Project structure

Stage 0: Lecturer process

The initial step in the project involves numerous consultations with stakeholders by the facilitator, utilising global HCD agency IDEO's¹ Design Thinking, methods that ascertain a basic set of needs. Stage 0 can be defined as 'pre-design', or the "fuzzy front end" of the project (Sanders & Stappers 2008, p. 6). This stage involves various interviews and site visits by the facilitator with stakeholders that will assist students with the relevant data required for Stage 1. Stage 0 was added five years into the project to help encourage more in-depth analysis and relevance for the projects to get greater clarity on the stakeholder's needs.

Stage 1: Empathise

The first PD workshop is held in class, with all participants and stakeholders in the same venue. Thereafter, formal stakeholder consultations occur online to accommodate stakeholder schedules. All online sessions are recorded and transcribed for reflective guideline purposes. Students then continue with informal consultations beyond the official online consultations throughout the design process.

In this first official session, the stakeholders, in this case, the Zoo Edu-centre management, introduce themselves to students, brief them on their projects and requirements, and help them understand the needs of the various projects. After the presentations, students pick a project to partner with. When a project proves too popular, students must pitch themselves and debate as to why they are the best choice to assist the stakeholder. The class then votes on who is the best fit for the project.

Stage 2: Define

Students are divided into groups based on their stakeholders. Within these groups, students draft a list of questions regarding their project requirements for their stakeholders. In consultation with the facilitator, students discuss stakeholder needs and potential problems during this phase. After this session, students must conduct further research on their project through site visits, interviews and desktop research.

Stage 3: Ideate

Students present initial concepts and rough prototypes based on the stakeholder brief and email responses to the stakeholder, the lecturer and the class online for feedback. Students consult the facilitators during this stage to expand on their design strategies.

Stage 4: Prototype

During this phase, students refine their prototypes with the facilitator. The stakeholders are consulted where possible.

Stage 5: Test and feedback

An online, facilitated feedback session is held with stakeholders to gain insight into the appropriateness and feasibility of prototypes. These online interviews are recorded, transcribed, and made accessible to students and stakeholders to review the communicated information.

Stage 6: Refine for application and ideate on potential extra solutions.

After extensive stakeholder feedback, students consult, refine, and start to finalise their prototypes. Students then identify and develop a secondary design solution, if necessary, with Design Thinking methods to help stakeholders improve further aspects of their business/process during this phase.

Stage 7: Project handover for application and further refinement

During the final student phase, all projects are packaged in relevant formats for the stakeholders to use after the project ends. Students create finalised project summaries, reflections, and presentations during this phase. These summaries include all process work from the project, the primary sources where the data was obtained, and all other relevant information gathered from the workshop recordings.

Stage 8: Follow-up with stakeholders on project implementation (after the student project)

During this final stage, consultations with UJ's Intellectual Property Office take place to help implement the project. Stage 8 is often the more difficult stage, as problems with implementation beyond the scope of the PD unit are often identified. Implementation is more successful if the design solutions formats are designed to reproduce easily with minimal cost. In the case of the Zoo projects, this stage can be rewarding if design solutions receive sponsorship.

2022 design strategy

The project again followed a Design Thinking strategy. Students managed to do extensive site visits, consult with more stakeholders, and receive feedback on implementation from the printing and production industry. Although the project had been shortened, the outcome and quality remained consistent.

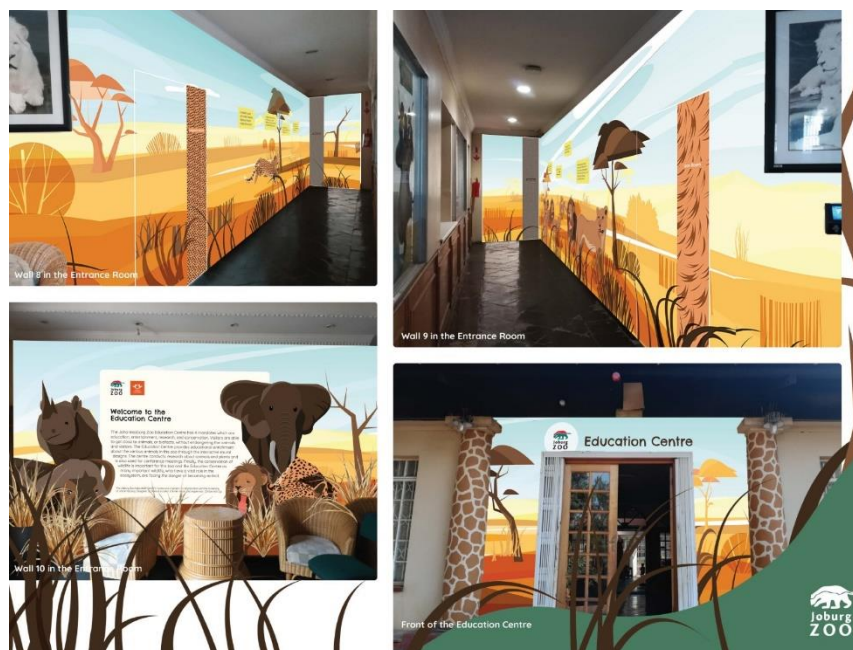


Figure 6: Excerpts from the Education Centre interior murals project 2022

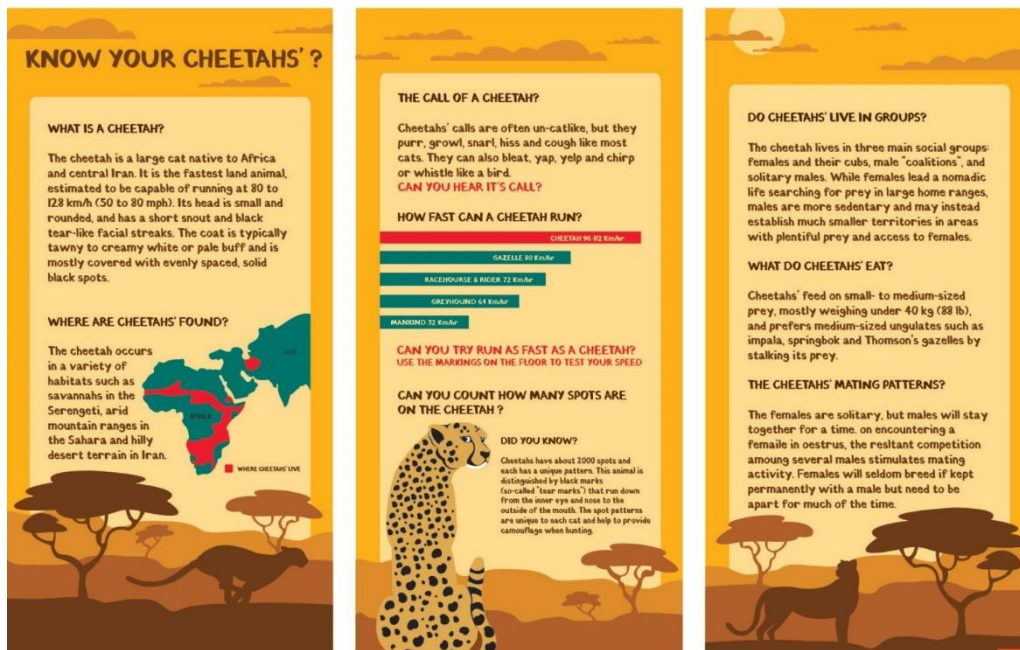


Figure 7: Excerpts from the Temple of the Ancients and Cheetah Fact Sheet Project 2022

2022 outcomes

One student designed the interiors for the Edu-centre with a Savannah implemented theme, based on the original names for the three main rooms of the centre (Figure 6). Other successful Honours Participation Design Projects for 2022 included an augmented reality wayfinding app, information boards by enclosures (Figure 7), interior murals for the Temple of the Ancients, and several selfie murals throughout the zoo.

Finally, in the middle of 2023, Zoo stakeholders confirmed that the building was in the process of getting refurbished. This project's successful concept and final discussion gave UJ GD, the stakeholders, and the students a more engaged opportunity in a real-world environment. Student success, assessment, and evaluation of the project depend on the choice of method and approach, idea integration and appropriateness, and personal style.

By applying an adjusted IDEO's HCD DT approach of discovery, interpretation, creativity, experimentation, and evolution, students managed to design appropriate work that met the needs of the zoo. As the facilitator, the stakeholders and the students moved through the different phases, reflection was encouraged and recorded in almost every project phase through feedback, discussion, and contemplation. According to Schon (1983), reflective praxis is part of the critical design process as students are encouraged to become reflective practitioners engaged in the outcomes within the project parameters.

According to Buchanan (1998), design ideas are at constant play and the pleasure that the paper toys brought to the children who visited the zoo played a big role in this project through the aesthetics and flow of experience as well as the knowledge fact sheet of the different animals. The students involved from 2011 to 2022 gained new confidence in their skills through these collaboration's various iterations, learning valuable lessons about professional practice and project implementation.

Student feedback from 2022

Student 1: "This project was an opportunity for me, as a student, to grow as a designer while helping develop the community of Johannesburg Zoo. This opportunity empowered students and the zoo because we contributed our knowledge and creativity to help the zoo [...] It made me work at my fullest potential at my current skill set, which was an eye opener".

Student 2: "I worked very well with the clients; they understood my vision, and I understood their needs. Feedback was a smooth process that I learnt to enjoy as it always bettered the refined artworks [...] I enjoyed the process of designing for children and adults from all walks of life with the intent to inform them of the beautiful animals we do not get to see every day".

Student 3: "Working with an external client allowed me to gain insight regarding clients within the 'real world' and how they may influence design outcomes. Working with external clients teaches students how to better engage with the project from an external, 'real life' perspective. This opportunity helps prepare one for the working world [...] Overall, I enjoyed the project and believe students should engage more in external projects to better prepare themselves as full-time designers".

Conclusion

Tertiary-based human-centred participation design projects such as the Johannesburg Zoo collaboration prove the importance and value of collaborative student-based design work. These projects boost student confidence, improve communities, and create positive change. The UJ GD PD unit applies Experiential Learning Theory by encouraging students to reflect on their actions and analyse their experiences and their positive impacts on the stakeholders (Kolb & Kolb 2008, p. 43). Due to the diverse projects within the UJ GD PD Unit, Constructivist Learning Theory practice becomes crucial to the project's success. Students engage directly through personal interaction, self-direct their projects within the various stages of the unit, and construct their own knowledge of the stakeholders to improve the success of the final design outcome (Chuang 2021, p. 6).

This project confirms the words of Robertson and Simonsen (2012, pp. 87-88): "When different voices are heard, understood and heeded in the design process, the results are more likely to be flexible and robust in use, accessible to more people, more easily appropriated into changing situations, and more adaptable to these situations over time".

In 2023, the collaboration continued with one student who designed an activity booklet for the Zoo Education Centre within the Participation Design Unit, which is being edited to pitch for possible funding. Many stakeholders have started utilising student projects because their implementation costs are feasible and minimal. Following the successful 2022 projects, the Johannesburg Zoo Education Centre is being upgraded and refurbished, with the support of the ongoing UJ GD PD projects highlighting the centre's value and potential impact on Johannesburg City Parks as the main sponsor. After the upgrade, the 2022 student mural designs will hopefully be transferred onto the walls. Due to the collaboration's continued success, this project's lifespan is now indefinite, and the successes have been evident.

The many years of engaging UJ GD students within this learning unit have given an overall sense of gratification, particularly when these ideas were implemented in the real world.

Please note: The author was given ethical clearance for this research project and all other Participation Design case studies from 2022 to 2024 by the Faculty of Education Research Ethics Committee. All

stakeholders have given clearance to list their names and agencies, and all student information has been kept anonymous. Ethical Clearance Number: Sem 1-2022-108.

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