3D Atmosphere through Gallery Showcase

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Abstract

This paper presents the findings of the research conducted on the basis of the created virtual showcase to explore ways in which an interactive 3D website’s atmosphere can be enhanced and fostered to benefit the design education and industry fields. Construction of the virtual gallery showcase was generated as an effective demonstrator to be utilised by students and designers in terms of promotional, training and educational gains. The interactive environment of the virtual gallery showcase provides users with a source for interactive simulations, design processes and variations, which enable the exploration and sharing of best design, construction and exhibition practices. The site was designed to be a valuable tool to communicate ideas and demonstrate design models of the university student’s product and interior architecture work, paying particular attention to the designs that won national and international competitions, received professional awards and/or chosen by industry to be manufactured. The immersive environment enables the visitor to interact with the 3D models via exploring every detail and all functionality of the design from the very first prototype to the final product, review design documentation and provide feedback to the designer. In addition, the online site facilitates the examination of the models from different angles, various configurations including the change of components, colours and textures, hidden and showed elements and simulations. Thus, at the fourth stage of the Interactive 3D Web Design project implementation, in order to evaluate potential and existing facilities of the virtual gallery showcase, the research of the website atmosphere was conducted. The study was carried out on the basis of randomly selected samples of students from design classes at a Brisbane university and accomplished Australian designers. The applied research methodology included two approaches; namely, experimental learning and action research. The first method, experimental learning, identified key characteristics of the website design in the aspect of suitability towards projects needs. The second method analysed university students’ and designer’s perception and evaluation of the website by practical action research. The research outcomes reflect students and designers viewpoint with regard to the first impression, aesthetic and emotional judgement concerning loading speed, professional appearance, navigational capability and presentation of the models to be exhibited on the virtual gallery showcase. The research findings contributes in gaining a better understanding of cultural distinction in design practices background, market trends and educational approaches employed in particular countries in terms of utilising web design facilities.
1. Introduction

The 3D learning resource ‘Interactive 3D Web Gallery Showcase’ (Fig.1) was built to be employed by university staff and students as a supplementary demonstrative tool in terms of delivery of creative arts, engineering and design programs within Griffith University. Moreover, the site was created to be utilised for educational purposes at primary and secondary schools, conferences, workshops and exhibitions. The project was devised by Design Lecturer Larry Vint on the basis of the framework constructed by Griffith University’s Flexible Learning and Access Services. The implementation of the project ‘Interactive 3D Web Gallery Showcase’ comprised 4 stages. Stage 1 involved the research of on-line galleries and 3D Web software which best catered for modelling 3D product designs and interior spaces for the promotion of student project models to both the public and education sector (Lepouras & Vassilakis, 2004; Baynes, 2002); as a result ten Web 3D software programs were analysed with a short list of four final alternatives, where according to the pre-set selection criteria the software Demicron Wirefusion was chosen as the best appropriate option. Stage 2 looked at the interactive requirements of the 3D models, the interface and functionality required (Bernardo, Preul, Zabramski, & Spetzler, 2003; Temkin, Acosta, Hatfield, Onal, & Tong, 2002; Brodlie, El-Khalili, & Li, 2000; Yoshida, Murao, & Miyazawa, 2000). Stage 3 investigated the website design and development, establishment of system structures, interface design, look and feel (Lepkowska-White & Eifler, 2008; Tsou, Wang, & Tzeng, 2006), database development, security (Koller et al., 2004) and compliance of accessibility standards with Griffith University corporate web standards. Stage 4 evaluated and documented website feedback from university students and practicing designers. On the basis of the records received during Stage 4 the analysis of the feedback and data from the survey, interview and observation was carried out in order to research the ways in which an interactive 3D website’s atmosphere can be advanced in terms of design, functionality and ambience and promoted to the design education and industry fields (Bennett, 2005; Craddock & Chevalier, 2002).

Figure 1: Interactive 3D Web Gallery Showcase project. Bicycle ‘Zippy’ designed and modelled by Vincent KaFai Cheng.

Quantitative analysis of the key characteristics of the website design in the aspect of suitability towards projects needs was undertaken in order to complete the software selection and develop the website (Lindgaard, Fernandes, Dudek, & Brown, 2006). The key selection criteria in judging the atmosphere capabilities of the software were based on pre-set criteria, namely:

- First impressions;
- Friendly navigation;
- Open language;
Emotional and hands-on engagement;
Ability to communicate and fun factor;
Online presence;
Interactivity;
Design benefits;
Revisit factor;
Users are in full control;
Novelty;
Software complexity;
Availability of options;
Function of model compression.

The anticipated benefits included:
- Open forums between students to discuss ideas and designs (peer monitored);
- On-line showcase which currently does not exist as a university facility;
- Teaching and learning tool for disciplines requiring interaction with 3D designs and interior spaces;
- Students’ work and design processes to be explored;
- Provide opportunities for students in other disciplines to collaborate with 3D and interior design modelling students on various visualisation projects.

The anticipated web facilities to be established:
- Option to include 3D interactivity, animations, images, sounds and documentation;
- Mesh optimisation - reduced polygon count of models for fast interactivity;
- Website interface;
- Administrative panel to facilitate the ease of object upload to site (dBase);
- Template for easy uploading and maintenance of showcase exhibits, textual information, production notes, etc, for each object;
- Website search function ‘Browse by category’ (design fields include: engineering design, fashion/performance costume, furniture design, interior architecture design, jewellery design, product design, etc). Category names to be added; for example, designer names, nationality, year designed, year of graduation, awards, etc;
- Product/design description;
- Designer statement/profile and contact details;
- Production notes consisting of sketches, concepts, how design evolved from storyboards, rationales, overview of design brief;
- Website guidelines;
- Peer monitored discussion forum;
- Website feedback;
- News blog.

2. Website atmosphere

The gallery showcase enables the user to experience, rather than merely observe designs on-line; namely, the user can explore 3 dimensional designs and environments in real time (Fig. 2). The interactive 3D content provides facilities to investigate models in a more intuitive way providing a richer multi-sensory experience than a traditional 2D Web site or movie. Additionally, design gallery as a tool enables to inspect new lines of products; to vary the accessories, colours, styles, and sizes with a click of a mouse button; to open and close, move and rotate parts analysing their functionality.
Furthermore, the showcase makes available the option to select documentation to view the design concepts and changes undertaken and read the designer’s thoughts and project analyses (Fig. 3). In terms of interior design the tool offers to take a virtual tour of an architectural interior to explore the internal spaces, create your own atmosphere by changing the design layout, adjust the lighting and visual effects (light sources, shadows, reflections and camera positions), add and remove furnishings, fittings and structures, select different colour schemes and material textures. The visitor can zoom and spin, click and feel, move and hide parts; experience sounds; and print out the design outcome. The visitor not only can create their own design, but also utilise the variations produced by the designer. A 3D interactive site enables the visitor to enjoy an environment full of rich sensory experiences (Fig. 4).

Figure 2: 3D Interactive content. Ring ‘Nire’ designed and modelled by Erin Hutton.

Figure 3: Model administration.
3. Research methodologies

The undertaken methodologies comprised two methods of research; namely experimental learning (Lepouras, Katifori, Vassilakis, & Charitos, 2004; Carver, 1996; Kolb, 1984; Kolb & Kolb 2005a; Kolb & Kolb 2005b) and action research (Davies, Howe, & Haywood, 2004), where the first method was applied before the site’s development, and the second one was employed during the process of constructing the gallery showcase. The experimental learning approach was set prior to constructing the website to gauge the appropriateness and suitability of the final four selected 3D Web software programs. This was undertaken by four technical and one academic staff, whereby four website prototypes were constructed on the basis of identified and tested key aspects of the project to meet the creative and atmospheric requirements. The data outcomes presented the framework model to build the website according to the most appropriate parameters of the software to satisfy the project requirements; as a result the Demicron Wirefusion software program was selected.

The second research approach, practical action research was conducted after the website’s framework was constructed (Schmuck, 1997). The resulting data is to be used for implementation of appropriate changes to the existing site in order to utilise the virtual gallery showcase as an effective and efficient tool via provision of a friendly atmosphere for the users. In order to gain a greater understanding of the design effectiveness and functional properties of the website, case studies of randomly selected university students and accomplished Australian designers were undertaken. The research was conducted on two university groups comprising fifteen students in each group and one group of four designers. The research aimed to capture the subtle design elements both positive and negative and analyse the personal attributes towards the content and functionality of the website (Lepkowska-White & Eifler, 2008). An action research design was carried out to analyse and collect data identifying problems and implement changes based on these findings. Data collections was completed on the basis of collated questionnaires, where Likert attitude and nominal scales were applied; participant observation and field notes; and follow up with informal interviews with selected students whose responses required further clarification. The research considered planning, acting, observing and reflecting identified phases of action (Kemmis, 1994). The research groups represented a mixture of gender, ethnicity and social background. Questionnaires, interview transcripts and observational notes were analysed on the basis of grounded theory approach. The research provided an opportunity to reflect on students practices.

4. Qualitative analysis of university student’s perception and evaluation of the website

In the findings presented below, students have been given pseudonyms.

The university student data collection from questionnaires, participant observation and field notes not only indicated the students’ preferences but also brought out some surprising multicultural observations on the Gallery Showcase. It was evident from the research that all the students surveyed would benefit from to having their work exhibited on the website. For example:
“Linda”

Linda is a university student in her mid 20’s who is very passionate about design. A classroom observation prior to the project indicated she had a medium self-esteem as a creative individual, and yet was very creative as evident of her project outcomes. In the same observation she was very dedicated in her studies and possessed very good computer skills. Interviewing Linda, she had previously used an interactive website, however had not seen a similar site to the Gallery Showcase. She was positive to having her work exhibited on the website, stating it was a ‘good platform for students to launch themselves into the industry’, and felt each student should exhibit five of their projects on the site. She indicated the strengths of the site were the concept and layout. She would like to see flash incorporated and the entry splash page as the inside of a gallery. She expressed a doubt that due to the very orange colour of the front page the menu and title information might be lost. Linda made a recommendation regarding the size of the images for the gallery showcase to be larger, she also indicated her preference to see more details displayed on the student’s contact information despite the comment the ‘student profile is great’. Her first impression of the site was very positive due to the graphics and indicating that the navigation was clear for tracking and understanding. She did not see the benefits for the viewer being able to change the projects colours, as ‘once you have played with that feature you would not want to necessarily do it again’.

“Yang”

Yang is an overseas student from Asian region who is studying in Australia. Discussions reveal he is in his mid 20’s and would like to work in Australia for a few years before returning home. Yang is quiet in nature but highly engaging and enthusiastic in conversation. His grades are above average and improving with every assessment undertaken. His computer technology skills are very good; however is modest regarding his abilities. Yang had neither used an interactive website before, nor seen a similar site. He indicated the appropriateness of the bright colours used in the Gallery Showcase, the interactivity and uncluttered environment; in addition he stated that the menu bars should be more ‘interesting’ and ‘innovative’. Yang suggested that the Gallery Showcase exhibit as many designs as possible, as long as there was a quality check procedure undertaken by lecturers. He wrote that the website would encourage potential employers as well as other students to visit the site and motivate students to create better designs.

5. Overall feedback

Greater emphasis is being placed on students work to be exhibited online for both their career prospects and to be used as a virtual folio, with the possibility to be seen around the world. The added benefit of exhibiting work in an interactive 3D environment is that it presents enhanced flexibility. Interactive 3D Web offers a powerful spatial interface that provides an exciting and engaging alternative to 2D page based viewing. Interactive 3D Web publishing enables the user to experience, rather than merely observe designs on the internet (Jensen, Olbrich, Pralle, & Raasch, 2002). Users can explore 3 dimensional designs and worlds and interact with the 3D content in real time. The integration of 2D and 3D content permits the user the capability to navigate the Web in a more instinctive way.

The feedback from the research supports this argument (Dalgarno, Hedberg, and Harper, 2002). Removing the barriers to the abundance of 3D data is a critical next step in offering a richer experience for students. 3D content provides greater and more effective access to data and takes websites to a new level of user experience. 3D Web is unique; environments can be experienced as they are seen in the real world or conceptually. Thereby the content and level of immersion for objects can be created that is unattainable on a 2D web page.
Students impressions:

- All participated students identified the benefits of showing designs in a 3D Web environment;
- The impact on colour preferences was significant in terms of gender, ethnicity and social background of the respondents; for example, students from the Asian region liked the bright colours used in the web site, while concern was shown by some of the Anglo Australian students;
- The typography was found as a concern by many of the Asian students, who indicated a more exciting font could have been used;
- Majority of Asian students preferred a busier website in comparison with preferences of Anglo Australian students; the existing blank spaces to be filled with symbols, images and backgrounds, despite the majority of them were not related to the websites content;
- Several students were familiar with the sites analogical to the virtual gallery showcase; however, the majority of students did not have this experience;
- All the surveyed students preferred to display their work in online format as 3D model rather than 2D one;
- A potential security issue; namely, if people can steal work placed online;
- The site motivated students to place more effort into their work;
- Request for larger icons of the students work;
- Every year add the best students work to the website;
- Limit the number of online products to 100;
- The website should indicate the top 10 student designs;
- The viewer can focus on the showcased products as the interface blended into the layout. Students were pleased with the uncluttered web environment;
- The website needs to be promoted;
- All participants pointed out the website as a place to revisit if the models are regularly updated;
- The inclusion of Flash rich data to be incorporated into the website.

All of the respondent designers confirmed that the virtual showcase could be a very effective tool, however it is required to be developed further taking into account provided recommendations, namely:

- First impressions content, menu, typography were simple, clean and generally attractive. Background artwork was eye-catching, however could be simpler and less colourful to place more emphasis on the designs being showcased. The background colours were very strong and therefore may clash with some design exhibits. It was suggested to have the background neutral colours;
- General layout very user friendly and works well but lacking in visual impact with a basic navigation area. The introduction page image is too dominant;
- Typography was readable and liked by most, but was indicated to be an old ‘cold’ font;
- Effective interactivity as well as clear and intuitive navigation; clean, smooth, simple, fun and fast to download;
- Website was seen as an efficient way to communicate a concept and to showcase designer skills, allowing users to explore at will and view all aspects of complex designs. A great opportunity to view peer work and promote your own;
- Revisiting the website is dependant on the work exhibited and if regularly updated. Curiosity to see what is being produced, more information on a design, such as the thoughts, ideas, concepts, emotions behind the designs were noted as bringing people back;
- Seen as a great entry point for industry to see designers work, to know more about the student;
- Each exhibited student should have a link out to their own website;
- Most saw the opportunity to promote oneself as a designer on this site as very positive one;
• Half of the designers would like to see their work on this site 3D interactive format. Moreover, it is suggested the whole website should be 3D, not just components, to achieve a complete 3D sensation;
• All respondents indicated that as many designs as possible to be exhibited, and like a resume only the last 10 years, unless relevant;
• The strengths of the website was its showcasing students work, interactivity, 3D elements, intuitive navigation, simplicity, general organisation, ease of use;
• The website could be improved by adding more visual impact to the navigation area, and showcase images with a simpler, sleeker more professional background;
• It was suggested to have the website main image and background greyscale or just splash of colour to be more effective, even though latest websites are designed full of vibrant rich colours.

6. Conclusion

Conducted research demonstrated the benefits to be gained in applying the virtual gallery showcase as an educational and promotional tool for projects designed by university students in terms of completion of product and interior architecture design disciplines. According to the findings of the research performed on the data received from the surveyed students and designers, the constructed website requires changes in order to advance the functionality and enhance the interactive atmosphere. In addition, the study outcomes revealed that further research and monitoring could be required in terms on multicultural target groups and new coming generations in order to provide appropriate modernisation of the created virtual gallery showcase and ensure its utilisation as an effective tool in the frames of interactive atmosphere. The comments and recommendations, achieved on the basis of the conducted research, entail to be evaluated in order to assess potential risks and benefits which can be seen as a valuable contribution into the development of the improvement plan of action, taking into account short and long term perspectives.

References


