

From Card to CAD - Investigating 3D Model-Making in Set Design

Investigating How the Implementation of 3D Design and Printing Can Influence Model-Making Processes for set designers and Its Impact on Other Production Roles

1. Introduction

As a developing set designer that has been brought up in a time where technology is ever prevalent I was introduced to 3D modelling and printing in set design. The exposure to this really made me think of how the creative industries change and adapt with technological shifts along with 3D design and printing becoming far more accessible. its possible application in the industry and just how far 3D modelling and printing can go, Along with the possibility of improving the whole Set Design process became larger questions for me.

This project delves into and investigates the Implementation of 3D Design and Printing and how both of these can influence Model-Making processes for Set designers, along with its impact on other production Roles who would also need access to the models throughout the process focusing on their sustainability, time efficiency and financial practicality of the different options. This would be done through the Designing and construction of two set design models, A hand-made industry standard 1:25 scale model and a digitally designed model that would be accompanied with 3D printed elements. Throughout this I would be collaborating with a peer, Deryn Allen-Dyer, they would be my director through my practical project allowing me to have immediate feedback from a director on the project.

This project focuses on three main themes: sustainability, time efficiency and financial efficiency, all of which are important themes to investigate in a self-employment dominated field. Through interviews with industry professionals, my own practical project and reflective analysis, I aim to understand how the emergence of 3D design and printing will compare to hand made models. along with how this will affect other industry roles in different ways.

2. Literature Review

2.1 - Introduction to the Literature Review

This literature review aims to examine existing research on hand-made models, digital models and 3D printed models, within modern day set design, with a focus on Sustainability, time efficiency and financial efficiency. And though scale models have been vital to theatre and film design for a long time now, the actual documentation and academic literature for their sustainability, time efficiency and financial efficiency remains to be incredibly limited. Much of the available documentation focuses on the actual design, or the sustainability of the actual full scaled set.

in the same vein, digital modelling and 3D printing has become more accessible to designers as of late, however research exploring their integration into theatre, film and television is still emerging. Even then, the majority of these articles or studies highlight the potential of digital modelling and printing without then dressing the limitations of them amongst multiple roles working together and their sustainability. My aim is by reviewing literature in both traditional and digital designing I can establish context for this projects comparative investigation and identify the lack of specific research that this study responds to.

5.2 - Traditional Physical Model Making in Set Design

Hand-made models have been a foundational aspect of theatre design for years, as it functions as a creative form of communication between set designers, lighting designers set construction and directors. In Model Making for the Stage (Orton,2004) Keith Orton touches on the importance of physical models and their importance for designers to “test ideas in

three dimensions and explore the spatial relationships of the set” This quote really speaks to how important models are to designers, pairing this with what Michael Taylor said when I interviewed him (see appendix A2) that “the main person the model is for is for you. It is for the designer”.

The practical, hands on nature of model-making is also reinforced by Mark Friends’s Scale models where it talks about the model making process and outlines the importance of skills in cutting, shaping and assembling pieces. This really enhances the fact that an important element of model making in set design is the tactility of it.

Max Jones mentions that models are also really important for communication between roles, saying “the scale model’s key purpose is to convey the staging concept for a production to the rest of the team” Jones(2017) he really emphasises just how important a model is for the other roles in the design stage.

However physical models have their downside, with many of the materials being difficult to recycle, such as foamboard where industry sources like Motive Exhibitions Who use a lot of foamboard (Foamex is the brand name) and state that the board itself isn’t recyclable they state, “Once PVC foam boards or Foamex are printed on, bonded to another type of material, or have adhesive or vinyl’s applied they are now “contaminated”. This means they cannot be easily reprocessed – or potentially recycled at all. The outcome landfill.” And looking more at once a model is built and then decorated, i.e. painted, it also becomes unable to be recycled. Acrylic paint, one of the most commonly used paints for a lot of designers for its versatility, cannot be recycled. While acrylic paint itself is a plastic based resin paint, so cannot be recycled. While Russell Richardson a recycling company in the UK talk about how even if the paint could be removed, that’s not the only problem. The main problem is “the fact that the paper has been wet. Once paper or cardboard has been wet, the paper fibres are damaged and can't be recycled.” (Russellrichardson.co.uk, 2018)

Because of this, the theatre green book encourages designers to think more sustainably, but doesn’t mention itself about the sustainability of Scale models. However there are examples of people trying to be more sustainable, this is shown through a Dropbox library for designers, that has files such an excel sheet that talks about who has what model box for what theatre and how to contact them. Reducing the need for designers to buy and waste new materials on something that already exists.

5.3 - Digital Model-Making & 3D printing

Digital Model-making refers to the creation of set models using Computer aided design software’s. Designers are able to build a virtual version of the set on a screen which allows for a lot of flexibility in the design. Langdon speaks on the importance of changing with technology, along with how digital tools allow designers to work with really precise measurements, duplicate elements quickly, and make quick changes without needing to rebuild anything by hand. It enhances the idea that digital models are quicker to produce than physical models.

Digital models also have sustainability benefits, like the fact that there is no material wastage and the fact that the theatre green book encourages designers to use digital methods of design. One of the downsides of digital models is the lack of tactility of the model, directors often like to be able to hold models and change them around so they can communicate what is in their head. This perfectly moves us onto 3D printing as a physical choice for digital models, 3D printers have a limiting amount of information out there at the moment, with people encourage using it for its ability to reduce waste, however a lot of people aren’t talking about the wastage that comes from failed prints, however there are people trying to make this better like Recycling Fabrik, a German company that focusing on improving the sustainability of 3D printing materials and waste. They specifically say that they “focus on material recycling: sorting, shredding, washing, melting, and reusing.” (Recycling Fabrik GmbH, 2025)

Overall, The literature shows that digital model making, definitely has future possibilities along with current time possibilities. It opens up possibilities of Virtual Reality exploration of designs. But is also limited by the fact that it requires technical skill to achieve and access to equipment and technology that not everyone has access to.

3. Methodology

3.1 - Research Approach

This Project uses a practice-based research approach, allowing me the opportunity to explore the idea I presented by actually exploring it myself in two separate models. Being able to do physical research was appropriate for this investigation as Model making in Set design is definitively a physical topic and from looking at a lot of research, is fundamentally lacking in information out there. The ability to be able to compare the physical and Digital models requires being able to physically engage with them. The materials to create them, the tools and the process itself all require being able to physically interact with them.

This leads onto the projects research also includes qualitative research methods, specifically semi-structured interviews with industry professionals. This allowed me access to first hand experiences and knowledge that I couldn't find through my other forms of research. Along with a questionnaire that allowed those who couldn't make interviews to answer questions and input their own experiences in their own time frame.

With the basis of this project being comparing the hand-made model and digital model making, a comparative methodology makes sense. It encourages the Structured evaluation of the hand-made model and the digital model / 3D printed model across the key themes mentioned earlier: sustainability, time efficiency and financial efficiency. All of which are supported by the systematic collection of data including time logs, cost tracking along with material wastage tracking where possible. Finally I also used reflective practice throughout the project to be able to analyse my own decision making, skill development, efficiency and my responses to any challenges that popped up. All together all of these different approaches gave me a methodology that has access to analytical information and real world intel.

3.2 - Practical Methods

For the practical element of this project, it involved designing and constructing two industry stand models. One would be a 1:25 Scale model, the scale being the standard for theatre-based models, the other being a digital model made using Autodesk's Fusion, An industry standard modelling software that I could then port to Prusa Slicer that I could 3D print from. The first model was crafted using hand-made techniques, following skills I had been taught myself from other industry professionals in my education. This process also involved selecting the appropriate materials such as mountboard (also known as white card) along with foamboard, balsa wood and adhesives. Some tools also needed to be bought for a model, such as craft knife blades which need to be replaced often for precision and clean edges. Throughout building the model I recorded the time spent working on each element, the amount of material wastage, and the cost of the materials in a table as shown in appendices C1-3.

The Second Model was produced using AutoDesk's Fusion 360. With initial Models being done in there along with the final model also being done on there. Once the final models were finished, the files were then exported over to Prusa Slicer, a software used to generate G-Code which is a file format necessary for 3D printers to be able to print your model. Here I worked with changing the print orientation, infill density, supports, and layer height, each of which affected the Print time, Filament usage and Surface quality. Any failed prints, reprints and filament wastage were documented as part of the sustainable aspect of this project. I Also recorded how long each element took to model and then how long to print separately.

Both Models were divided into comparable stages – Initial model and white card model. To

make sure each method could be evaluated consistently. And by tracking time, cost and material wastage systematically in a table across both processes the practical investigation generated measurable data that I could then use to investigate the themes of sustainability, time efficiency and financial efficiency for this.

2.3 - Collaboration With a Director

A huge component of this project involved peer collaboration where I collaborated with Deryn Allen-Dyer, whose role was one that allowed me to reflect on the collaborative nature of set models with other roles within the industry. Working with Deryn allowed me an authentic hands on contact with a director who could evaluate the two models and give invaluable points of views on them and allowing a real design and director relationship. Throughout the project I present models to Deryn at each stage much like you would for an actual show, giving them a chance to give creative, practical and spatial feedback with one final interview at the end shown in Appendix A3.

This also offered invaluable insight into how directors interact differently with physical and digital models, emphasising the different limitations each one has along with each of their own strengths too. Being able to do this in person with a director really allowed for concise responses to both models.

This process was incredible valuable and contributed to the project's investigation into how the two different models interact within different roles in the process. So, by having this collaborative aspect to my project it really enhanced my methodology as it brought in real world practices that supported the wider research and analysis of how the model-making process affects other production roles.

3.4 - Interviews and Questionnaires With Industry Professionals

in support of the practical investigation, I also conducted small-scale qualitative research. Consisting of one semi-structured interview with an industry professional, one interview with an amateur 3D printing practitioner and a multi-layered questionnaire that was distributed to professionals who couldn't make interviews due to time constraints, which received 4 responses. And as much as this qualitative research was modest in size, having multiple methods that provided me with a wide range of responses from differing roles and also differing levels of experience with both traditional and digital model-making.

The industry professional interview offered insight into their model-making practices, their experience within production teams and their experience with physical and digital models within the industry. In complete contrast the 3D printing amateur, contributed practical knowledge on 3D printers the kind of information you wouldn't find generally like filament behaviour, print failures and just how easy or difficult accessing 3D printing can be for not only designers but also amateurs. Being able to have these two interviews helped in contextualising two varying view points on 3D designing and printing.

The questionnaire responses provided more generic but wide cast information, ranging from people who have just started their careers to those who have been in it for some time, it also allowed for varying roles to answer the same questions and also have some role specific sections in it later on too. With the data from the questionnaire analysed in accordance with the 3 themes from earlier, Sustainability, time management and financial efficiency. This element of qualitative data allowed to help the comparison with real practitioners experience of it.

3.5 - Data Collection

For this project I focused on gaining measurable and comparable information on both the handmade and digitally made and 3D printed models. For each of these models I recorded the time spent at every stage of the process for each element. I kept each of the logs in a table to be able to easily access and witness at a later stage, see appendix C1-3.

for the financial efficiency, I kept a log of the cost of materials and resources used. For the

hand-made model this consisted of mountboard, foamboard, Balsa wood adhesives and replacement blades. For the digital model, this consisted of Filament usage and Failed prints, software used was also noted down along with energy consumption of devices.

Material wastage was documented throughout both processes. Waste from the hand-made model was measured by collecting offcuts. While digital was measured by recording the grammage of filament used for each print which was able to be found through Prusa slicer, and any failed prints were kept along with any support structures saved. These data sources were an incredibly important foundation for comparing the two model making methods.

3.6 - Ethical Considerations

Throughout this process ethical considerations were addressed to ensure responsibility and respect to not only those participating in the research but also the research itself. All interview and questionnaire participants were informed of the projects aims and also gave consent for their contributions to be used in the study, along with specifically for interviews the ability to record them. The collaborative work with the director was conducted mutually and transparently with clear communication about the expectations and the impact of their involvement.

3.7 – Limitations

This project has several limitations that absolutely should be acknowledged. My qualitative research component was small in scale, consisting of one industry professional, one amateur 3D printer and a very limited questionnaire response list. While these perspectives were very incredibly helpful to me, they do not represent the full range of professionals in the industry. The practical comparison between the two models was also influenced by my own skill level which is still being developed, which may have affected time efficiency. These limitations do not undermine the project but should be considered when interpreting the findings.

4. Practical Investigation / Process

4.1 - Introduction

The practical process forms the basis of this project, allowing me a first hand comparison between traditional hand-made models to digital and 3D printed ones. While the Literature Review talks about the theoretical and professional context, this talks about the practical exploration of both model making methods while employing industry-standard techniques. Undertaking both of these processes allowed for me to observe and experience the different themes first hand, in ways that cannot be understood by just reading literature alone.

The investigation also gained insights from industry professionals through interviews along with collaboration with a director providing me with real-world experience that helped inform the making process. By documenting each stage from initial construction all the way to final presentation. This section allows me to outline the practical realities of each method and highlight the pros and cons of them. This forms an important foundation for the comparison of the different methods.

4.2 - Building the Hand-Made Model

The construction of the hand-made model followed previously established industry standards of being in 1:25 scale. It also drew on advice from industry professional Michael Taylor. The process began with the creation of the initial model I did this using foamboard as I was in need of rigidity and strength to be majorly handled and moved around, while also needing it to be light weight so I could transport it. Some simple forms of the rough final modular shapes where to preserve materials, they were taped together to preserve the materials so they could be used again instead of wasted. I also used white card to cut out the entire size of the area we had to work with, which we had decided was to be the generic area of a school gymnasium as they are the most commonly found large indoor spaces.

During this initial phase I also worked hard on ensuring that I reduced material wastage as

much as possible, with one of the ways I did this was by employing nesting techniques. Nesting techniques are the process of planning out where shapes can be cut out on a sheet before actually cutting it, allowing you to waste as little material as possible. I personally drew out the size of the foam board I was using in AutoDesk's AutoCAD and then manoeuvred the shapes I needed in such a way that I could get the most efficient amount from one sheet, shown in appendix E1.

This initial model making also highlighted the intensity of the nature of hand-made models, cutting that much foamboard left my blades quickly dull meaning I needed to replace them often else they would drag the internal foam instead of slicing it. With minor inaccuracies then needing to be recut to maintain structural clarity and clean edges. And with needing to replace the blades often it meant it heavily contributed to both cost and wastage of the blades. Thankfully by not using adhesives that this time, I was able to save time with not needing to wait for glue to dry, and also materials by being able to reuse them.

As we moved into the white card model, the tactile and iterative qualities of hand-made models became increasingly apparent. Where even with the director being happy to use the digital software, they much preferred the tactility of moving the model pieces by hand. It allowed for them to instantly visualise what they were thinking and manoeuvre it themselves in ways that felt comfortable to them.

Throughout the modelling, I kept records of how long each section took me, any wastage, and whether that wastage was recyclable. Wastage accumulated quickly, with most of it being small offcuts that I wouldn't be able to reuse and with it being foamboard, would have to throw away instead of recycle, due to it not being widely accepted in the UK.

Overall the construction of the hand-made model provided essential insight into the material usage and wastage in the Set design industry, along with the directorial interaction with a physical model too. The process highlighted both the strengths of hand-made models and the constraints that came with it too.

4.3 - Building the Digital Model & 3D printing

The digital model was developed using AutoDesk's Fusion. Following what is considered the industry standard for CAD-based modelling. The process itself began with constructing the base area and then constructing the simple modular components. This leans into the great aspect of fusion where you can create one component and then import it as many times as you want into a separate constructive file. Allowing for editing the original file and the big file automatically updating with any changes. Unlike the hand-made model, the digital model required precise measurements and dimensions to be able to be put together. This shift in approach definitely highlighted the immediate differences between the two model types.

Modelling in fusion offered huge control on the shaping of items and the production of them. With the fact that once I had finished one of the models modules, I could duplicate and I would very quickly have the amount that I needed, saving hours of remodelling, with no possible material wastage. This was improved even more by my ability to go back to the original component and make edits to it, which would then be transferred over to the duplicates. However, the learning curve of this software was intense. It was not my initially intended software however, as I had intended to use Sketch-up as it can be a free alternative.

One of the downfalls of the free version of sketch-up was that you could only save files to the cloud, which has normally been okay, but with the AWS outage on the 20th of October 2025, it left me unable to access my cloud during the outage and even reverted saved files to previous versions after it recovered. And while this isn't a common problem, it caused enough of a problem that I needed a far more dependable software that I could access. Thus entered Fusion, as an Autodesk software I was aware of its dependability and my own access to being able to download files locally to keep them safer. But my knowledge on the software was limited as I had only used it through instructions from someone else before, however it

was a very intuitive software I felt incredibly easy for me to pick up.

Throughout this process I recorded all of my time taken on each component and I was able to calculate energy consumption into cost for the digital modelling along with the actual cost of the software. one of the alluring aspects of digital modelling is that there is no material wastage in this form, so there was nothing to add in that theme, however that is where 3D printing comes into this.

Once we reached final digital models, I moved onto 3D printing them, to once again regain some of that tactility directors love. I initially planned to 3D print the entire set model myself, maintaining access to a 3D printing from a peer I could use. However, Part way into the process I was made aware of university changes that meant 3D printers couldn't be left in unlocked rooms, and if I were to 3D print through the university every print would need to be logged. This comes after apparently a student at a different university 3D printed a weapon, though I have not been able to find any recent articles or evidence of this specific reason. There are many other examples of 3D printing being used to produce guns even in the UK. While this change is a necessary one to ensure the university and student's safety, it also limits access to 3D printing that bit more. And because of this In the end I had to limit how much I 3D printed as the person that was able to print them for me, wasn't able to constantly access and start the machine like I could have done if it were in a common room. A bonus of this however, was that I was able to send them the STL (the file format of digital 3D models) and they were able to process it into the 3D printer far better than I could have done as a beginner to 3D printing.

as for the 3D prints themselves, they came with the problem of failed prints, or prints that finished but were inherently weak and had to be repaired. There are two such examples of this, the first is the doorway module of the set that was 3D printed shown in appendix D8, for the second level the pillar had wobbles when printing and so when taking the supports off it snapped, I was thankfully able to repair it and still use it. And the second being the wall section of the model shown in appendix D7 having a major print error where the gauge that sets the height of the nozzle, seemingly malfunctioned and went lower than it should have and started dragging through the almost finished print. Making it entirely unusable.

4.4 - Integration of industry professionals and Director Feedback

Insights from industry professionals and Deryn my collaborating director played a greatly important role in contextualising the practical investigation along with shaping how the decisions were made during both model making processes. The Semi structured interview with Michael Taylor, shown in appendix A2 , was I think one of the most helpful. He gave me not only a lot of insight into how he works, but also his attempts at finding out about sustainability in theatre along with his opinion and preference on 3D modelling/ printing. He also mentioned that a lot of director's he's dealt with have preferred the use of physical models for their tactility and that he himself prefers them too.

Being able to interview someone who was familiar and comfortable with 3D printing was also really useful, they had first hand experience of a lot of common problems, including warping, along with generic advice and their help with printing elements of my 3D models, shown in appendix A4.

Getting Feedback from Deryn was also incredibly helpful too, and being able to do an interview at the End of the Project was also really useful as it gave me a really solid groundwork for a different role's interaction with the models, which I felt I was really missing in this level of depth. They emphasised their preference for physical models, but also their understanding and acceptance of digital models, not being put off by not necessarily knowing how to use the software.

4.5 - Summary of Practical investigation

The practical investigation was incredibly helpful in providing a foundation as to how

traditional hand-made models and digitally modelled and printed models operate in real design situations. Constructing the different model types were invaluable as to how they showed the distinct demands, pros and cons of each variant. The hand-made model emphasised the need for tactility while the digital model highlighted the importance of accuracy and precision.

interviewing different individuals or relevance was also an element of dimension that I had absolutely needed and offered differing insight into each of their own area of skills. All of these together helped me form the foundation of my analysis in the next chapter.

5. Findings & Analysis

5.1 - Introduction

This chapter presents the findings generated through the practical investigation, and gives me a chance to analyse them in relation to the project's three core themes, sustainability, time efficiency and financial efficiency. While the previous one spoke about the physical process, this one will delve into the implication of those observations and compare how they did amongst each other. This will be organised thematically starting with Sustainability.

5.2 - Sustainability Findings

across the models some distinct patterns were revealed, specifically in relation to material consumption and waste. Data Recorded in Appendix C2 showed that the hand-made model required a greater amount of materials than either of the other two. Needing 6 mountboard A2 sheets and all 4 of the white foamboard sheets I had bought along with 14 blades being used. While all of these materials formed the final model, each of these materials had their own offcuts and wastes that were produced even after trying to be efficient with nesting. And when using foamboard any of those offcuts cannot be recycled in household recycling in the UK. With another thing to note that once a model is painted, it cannot be recycled. Not only as acrylic is a plastic based paint, but also as mentioned in my literary review, paper and card specialists will argue that once paper or card have gotten wet, it cannot be recycled due to the fact that "moisture damages the fibres in the paper" (Russellrichardson.co.uk, 2018).

The digital model making however is definitely better as the UK's electricity come from a majority of green sources, making the energy usage sustainable but once 3D printed it too cannot currently be recycled easily. From looking at appendix D7, you can see that it had a failed print, this print was quite far along into the time and unfortunately the 3D printer malfunctioned and the nozzle height failed, which ended up in the very hot nozzle dragging through the already printed layers creating a very spidery failed print in the end. And once again the entire print is now waste, which isn't great for the environment. It also begs to question with the machine malfunctioning, just how sustainable the machines themselves are, and how a small problem can ruin hours of work in a print that you can't then fix. During my interview with Michael Taylor he asked a valid question as to whether a model can be edited after printed, in example, sliced up and glued back together. It also adds to the sustainability that if the design changes, there's no real reusing of parts as they can't be edited or adapted, they'd be wasted and reprinted.

Overall the only one of the 3 methods that can be considered sustainable is the digital model, without 3D printing any of the elements, the other two both have their own form of environmental impacts with wastage. Those distinctions will however be evaluated deeper in the Discussion Chapter.

5.3 - Time Efficiency Findings

Time efficiency showed the clearest contrast between all the model making methods, as shown by the data in Appendix C1. With the digital model taking definitively less time than either the hand-made or 3D printed model: while the digital model took 176 minutes, the 3D printed model took 3285 minutes, which is a vast difference between the two. And even the

hand-made model took 561 which is a lot more than the digital model, but nowhere near the time it took for the 3D printed model. Paired with the knowledge that this time, doesn't even include the entire Set Design, but one of each element and the fact that the 3D printed models time includes a failed print, which took a long time to print and then fail when so close to the end. However, in the opposite breath 3D printing took the longest but it didn't require you to be with it the whole time. You would be able to get on with other things while it printed, stopping occasionally to check it hasn't failed.

This was also noted by the director, who mentioned during the process that they were able to quickly access a physical model, while they had to wait a while to access the 3D printed version.

Overall these findings suggest that while once again Digital model making was the quickest, to get to the physical aspect with 3D printing, took a lot longer and was significantly less time efficient than a hand-made model. Again These distinctions will be developed further in the discussion chapter.

5.4 – Financial Efficiency Findings.

The financial efficiency was actually a really interesting experience. With results that were incredibly shocking. While the hand-made model required a wide range of materials that varied in cost, and often with shipping times you'd have to guess what you may need before actually knowing, leading to over ordering items that don't end up getting used it wasn't the most expensive of the methods, not even close to either. Looking at appendix C3, the most expensive was actually the digital model at £3864.06, as the software's used, though I currently have them on an educational version, in the industry you would have to subscribe to them either yearly or monthly which is a huge amount of money to invest for two software's. Moving onto 3D printing's pricing at £2129.08. where once again the main bulk of that comes from Fusion, but also the cost of a 3D printer. Both of these methods were significantly higher than the physical model which even including the cost of unused materials sat at £1993.50, with the bulk of that being the cost of AutoCAD, if we removed that and considered it an optional software, the total would only be £103.52 A far cheaper option even if we were to break down each of the software's used in digital and 3D printing into monthly prices.

Overall the Financial findings suggest that the hand-made model is more financially viable for your wallet. While the digital version is software and hardware dependent all of which cost money if aiming for the industry standard. With this being the last of the three findings it allows me to look at these findings in a deeper evaluation in the discussion chapter.

6. Discussion

6.1 - Discussion Overview

The practical outcome of this project compared three approaches to model making in set design, Hand-made models, Digital models and 3D printed models. The findings showed that each method had its out forthcomings and limitations, especially when it came to the three theme focuses, sustainability, time efficiency and financial efficiency. Physical models were shown to be the most tactile, supporting collaboration and communication between roles which is vital, but they also had the most material wastage. Digital models were faster to edit and adapt, acing their way through time efficiency, produced no wastage so sailed through sustainability. Sadly it fell down on two points, cost efficiency, it was the most expensive choice, with the software prices, and also on tactility. Directors love to move things around and some struggle to explain what they mean without showing it, which is where digital falls down as unless they are willing to learn how to use the software it's a bit difficult. Finally 3D printing initially seemed like a viable solution, merging the tactility of physical models with the efficiency of digital models, however they fell down on almost all fronts, they had a high

cost from software subscriptions, a high material wastage from failed prints, and took a long time for them to actually print, while also not being able to be easily editable. They did however have a great amount of detail in the actual print, which was definitely a pro for them.

Overall the investigation demonstrated that no single method is universally superior, each had their own places where they worked best. The biggest thing that came from this was the highlight on how the industry is slowly shifting towards a hybrid workflow, with some directors liking digital models and some preferring hand-made ones.

6.2 – Strengths and limitations of each model making method

Like I mentioned in the overview, each model making method had its own area that it stood out in. Each had strengths and for some, major weaknesses.

Physical models, were found to be the most tactile and communicative model method, with many directors stating how they preferred them for this reason, an example of this is a response I got in my questionnaire: “I prefer physical models because they're tactile and it's useful to be able to hold specific elements and ask questions about things you might not have thought of compared to a digital version.”

Physical models also surprisingly did the best in regards to cost, even over buying supplies, that would be able to be used in the future. This honestly went against my initial thoughts of it being the most costly one. I was however right that it was the one with the biggest amount of wastage, and even then a lot of it was unable to be recycled, which is definitely a limitation of this method.

Digital models did the best in time efficiency, sailing far ahead of the other two, it allowed for really quick and efficient creation of models, along with an easy ability to change a design as and when it changed without spending ages having to redo everything. A great thing it had was an ability to easily share it with others, files can be shared instantly with others, and with Fusion they can view it online without needing access to the software itself, this is emphasised by this response to my questionnaire “Absolutely. One of the biggest problems I have is access to the model, designers need to take it away often for reference for set designers, makes, prop makers and any other department that needs it. This means that we can't have it in rehearsals as much as we'd like”. It did however have a few downsides outside of the three themes, access to some industry standard software's you have to pay for, such as AutoDesk's Fusion, and the cost of this software doesn't come cheap either. There is also a large learning curve with the software as you get from any kind of software, which if someone isn't comfortable with the software it may take a while to do. While one of digital model's major failures is its lack of tactility for industry professionals.

Finally, 3D printed models, I often thought of these as a hybrid between hand-made models and digital models. They provide the tactility that directors really want, while also the precision and repeatability that digital models have. However it wasn't actually as simple as that, 3D printing came with many challenges, such as the cost being quite high with the need for software subscriptions, and also access to technology like the 3D printer to be able to print, all of which aren't cheap. It also took a long time for printing sections of the set. While that came with the bonus of being able to do other things while you waited, in the amount of time waiting for one of each section, I was able to complete all the sections needed for the physical model. 3D printing also falls down on sustainability at the moment too, though there are companies trying to solve this like Recycling Fabrik. They're not large enough to deal with anyone outside of Germany, and even then it is too much and since starting this project they have stopped accepting parcels as they currently have too many.

7. Conclusion

This project set out to compare Hand-made models, digital models and 3D printed models withing set design. The focus of this comparison was on the sustainability, time efficiency and financial efficiency, I also wanted to look at how these models interact with different roles in the industry. An initial struggle I had was the lack of relevant information out there on these topics. It definitely made research a huge struggle for me. However even though it was limited too, I found that my qualitative research gave me a lot of useful information on different areas I was lacking in.

I also found that comparing the three models was a very null hypothesis, as at the end of the day there was no clear winner, each one majorly fell down at different points, hand-made fell down over sustainability as it produced a lot of waste that couldn't be recycled due to contamination or just the material itself. Digital fell at it's cost, with a lot of the costs of these software's being thousands of pounds, which is a lot to be paying. It also fell down at its tactility for other production roles, directors who the model is often for, prefer them to be tactile so they can move them about, interact with them in many different way. Which was where I was I had thought 3D printing would succeed but unfortunately it also fell down at sustainability, financial efficiency and time efficiency. Though for smaller models it would possibly be more effective.

Overall, I think the findings from my project, is not for any designers to focus on one specific type of modelling, but all of them and embrace the hybrid methods. With using each method where it is strongest for that current situation. This also reflects a current shift in the industry towards a more sustainable future. However this study highlights a gap in exiting literature in this field, while there are many articles on sustainability in the construction of sets, there is not enough on the models that come before them. And I hope by addressing this gap, this project contributes a new kind of insight into how designers can be flexible with their methods.

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9. Appendices

A1 Consent Section

Before each interview, I specifically asked everyone a couple questions for ethical consent. Do you consent for this to be recorded and kept for future reference? and are you okay with me using this in my dissertation?

A2 Transcript with Michael Taylor

Participant name: Michael Taylor

Role: Set Designer

Date: 16/03/2026

Method: Microsoft Teams Meeting

00:00:00 Michael Taylor

Of course.

00:00:00 Nicole Julier-Goodwin

Yeah.

00:00:02 Nicole Julier-Goodwin

So I'm in my final year now.

00:00:06 Michael Taylor

Right.

00:00:06 Michael Taylor

Good.

00:00:07 Michael Taylor

And how are you?

00:00:09 Michael Taylor

Am I being interviewed for a project or what?

00:00:12 Nicole Julier-Goodwin

Yes.

00:00:14 Nicole Julier-Goodwin

I'm interviewing you for my dissertation.

00:00:18 Michael Taylor

Right.

00:00:19 Michael Taylor

Fine.

00:00:20 Michael Taylor

How many designers are you interviewing?

00:00:24 Nicole Julier-Goodwin

As many as possible, really.

00:00:27 Nicole Julier-Goodwin

I think I currently interviewed four others.

00:00:33 Michael Taylor

Who are the others?

00:00:34 Nicole Julier-Goodwin

Oh, it's a couple of people that are on my course at the moment.

00:00:39 Nicole Julier-Goodwin

And then also someone that I went to college with who is now currently in the film and TV industry, which is great.

00:00:48 Michael Taylor

Yeah.

00:00:49 Michael Taylor

Marvellous.

00:00:50 Nicole Julier-Goodwin

Surely enjoyable.

00:00:52 Michael Taylor

Good.

00:00:53 Nicole Julier-Goodwin

Daunting, though.

00:00:54 Nicole Julier-Goodwin

Daunting for sure.

00:00:58 Nicole Julier-Goodwin

Yeah.

00:00:58 Nicole Julier-Goodwin

OK.

00:00:59 Nicole Julier-Goodwin

So to start with, I'm going to do some of the generic questions.

00:01:06 Nicole Julier-Goodwin

So to begin with, can you give me a brief description of yourself as a set designer?

00:01:12 Michael Taylor

Yeah, I was just going to bring up the list of questions, but actually I didn't need to.

00:01:21 Michael Taylor

I've been doing it for about 40 years.

00:01:32 Michael Taylor

I tend to prefer sets to costume, mainly because the course I did, I trained at RADA, and the course I did was called Set and Scenery and Set Design and Scenery Painting.

00:01:50 Michael Taylor

and it didn't actually formally cover costume at all.

00:01:55 Michael Taylor

So I've had to kind of teach myself costume since finishing.

00:02:01 Michael Taylor

So that's always the area I'm slightly less confident about.

00:02:07 Michael Taylor

And the bit I'm, where I started really was, I mean, the course I did was,

00:02:17 Michael Taylor

excellent, extremely practical and there was nothing, there was nothing theoretical about it.

00:02:25 Michael Taylor

was literally, I started as a stage management student at RADA and then changed onto the design course, which involved, it was a year and it was designed to show a term with a professional director and a RADA student cast.

00:02:47 Michael Taylor

So it was a brilliant course in terms of being very practical, but it didn't have any kind of theoretical sides at all, which in a way was a gap.

00:03:00 Michael Taylor

But on the other hand, it was only a year, so it was good.

00:03:03 Michael Taylor

That's great.

00:03:07 Michael Taylor

Yeah.

00:03:08 Michael Taylor

So I suppose I'm, as a designer, I think I'm, I tend to be,

00:03:19 Michael Taylor

My natural instinct is naturalism, is I tend to, I think you have, for an awful lot of things, if you start by at least putting something on stage that people believe in, as much as hopefully they believe in the actors, then that's a good start.

00:03:43 Michael Taylor

And if it isn't something they,

00:03:46 Michael Taylor

I mean, it may work brilliantly without being something naturalistic, and I've done things which were naturalistic, but my natural instinct is to do, to do, you know, naturalistic detail, because then at least there's a sort of a grounding for the storytelling.

00:04:04 Nicole Julier-Goodwin

Yeah.

00:04:06 Michael Taylor

Yes, but that may just be me being old passion as well.

00:04:10 Nicole Julier-Goodwin

I like it.

00:04:11 Nicole Julier-Goodwin

No, I've 100%.

00:04:13 Nicole Julier-Goodwin

I've looked through a lot of your words on your website and they all look stunning.

00:04:18 Nicole Julier-Goodwin

Absolutely stunning.

00:04:21 Nicole Julier-Goodwin

Thank you.

00:04:24 Nicole Julier-Goodwin

Thank you.

00:04:24 Nicole Julier-Goodwin

So on to the next question.

00:04:27 Nicole Julier-Goodwin

How did you become a set designer?

00:04:30 Nicole Julier-Goodwin

So like how did you actually like get into the industry?

00:04:34 Michael Taylor

I.

00:04:36 Michael Taylor

As I say, I trained, basically when I left, I read English at university and then trained as a solicitor and worked as a solicitor till I was 28 when I went to RADA as a stage management student.

00:04:55 Michael Taylor

And then there was the year of being a design student where I changed from the

00:05:06 Michael Taylor

stage management course.

00:05:08 Michael Taylor

And there was somebody at RADA who also worked at the National in the technical department who arranged for me to get a trial as model maker for the head of design at the National, which was a fantastic- That's incredible.

00:05:29 Michael Taylor

It was a fantastic open that I started working for him in 1984.

00:05:35 Michael Taylor

And then carried on working sort of all the time that I wanted to get started.

00:05:42 Michael Taylor

I was working as somebody's model maker.

00:05:45 Michael Taylor

Oh, that's incredible.

00:05:47 Michael Taylor

And he was a very, very precise model maker.

00:05:51 Michael Taylor

And so it made me a very precise model maker.

00:05:54 Michael Taylor

And that was a fantastic start.

00:05:58 Michael Taylor

And in fact, I carried on

00:06:01 Michael Taylor

Every now and then, whenever there was a gap, I could ring him up and see if there was any work and sort of get, okay, I mean, and sometimes there wouldn't be, but sometimes there'd be something or sometimes he'd ring me and say, are you free because I need to make a model box or a model or something.

00:06:21 Michael Taylor

And that carried on till, I think the last thing I did with him was in 2009.

00:06:28 Michael Taylor

So it was,

00:06:30 Michael Taylor

It was 25 years of being able to work every now and then with him.

00:06:36 Michael Taylor

And that was really helpful.

00:06:38 Nicole Julier-Goodwin

Absolutely.

00:06:38 Nicole Julier-Goodwin

That sounds it.

00:06:40 Michael Taylor

Yeah.

00:06:40 Michael Taylor

And also he was he wasn't exactly a mentor, but he was a huge example of how to do it.

00:06:49 Michael Taylor

And his name was John Gunter.

00:06:51 Michael Taylor

And he was a he was a fantastic designer who'd worked in

00:07:00 Michael Taylor

He'd worked a little bit abroad.

00:07:03 Michael Taylor

He worked in Switzerland for a long time, for a short time, and then he worked in Germany every now and then and Italy every now and then.

00:07:13 Michael Taylor

So he got, he had a very sort of sophisticated theatrical sensibility, which was very useful.

00:07:27 Michael Taylor

At a recent

00:07:29 Michael Taylor

press night, I met another person who had worked for him and we were kind of comparing notes about what an example he was, how we would think here.

00:07:43 Michael Taylor

Because the skill he had was he would be able to think of one strong idea that would, I mean, often for something very large that you would then put on the stage or something

00:08:00 Michael Taylor

It was always, you made a strong statement of one thing and it was something that in some way helped the story or encapsulating the story or so on.

00:08:15 Michael Taylor

So that was really the most important part of my learning was working for him rather than what I did at RADA.

00:08:26 Michael Taylor

Because at RADA there wasn't really any guidance and I just kind of made-up.

00:08:32 Michael Taylor

I mean, there was a head of design, but they never, he didn't push me in any particular direction.

00:08:44 Michael Taylor

I think on one show he said the reason he didn't like it is it looked like a model from the Central School.

00:08:56 Michael Taylor

And, but that's which he clearly didn't like, but otherwise it was, it was, it was sort of left me to get on with it.

00:09:07 Michael Taylor

But that was sort of how I became a designer.

00:09:10 Michael Taylor

And then directors I'd worked with at RADA, then a couple of them, then got me to design fringe shows for kind of virtually no money in life.

00:09:21 Michael Taylor

I got started through that.

00:09:24 Nicole Julier-Goodwin

That's incredible.

00:09:25 Michael Taylor

But the whole thing, the whole thing's been a complete struggle, really.

00:09:31 Michael Taylor

I mean, I left London about six years after trading and moved out to Oxford, where I now live.

00:09:40 Michael Taylor

And that was sort of a career disaster because I then wasn't around to do the

00:09:51 Michael Taylor

fringe shows in London, which I really still needed to be doing.

00:09:56 Michael Taylor

And so luckily I then got some work with a community theatre company in Wiltshire, which sort of kept me going through the 90s.

00:10:07 Michael Taylor

And, but it was then all very, it wasn't a very successful career throughout the sort of 90s and the

00:10:20 Michael Taylor

There was sort of enough work and I got a little bit of corporate work and I did some scenery painting and some prop making.

00:10:31 Michael Taylor

But luckily in 2010, I got a very good job, which was a show in the West End, which I got basically through my agent.

00:10:44 Michael Taylor

It was the only time my agent has

00:10:48 Michael Taylor

done something kind of transformative, but it was very good news.

00:10:53 Michael Taylor

And that was a production called The Lady Killers.

00:10:57 Michael Taylor

Oh yeah.

00:10:58 Michael Taylor

And I think my agent rang me from the, he was going on holiday, he rang me from the airport and he was saying he was astonished to hear that I'd got the job because there were a lot of much more famous designers who were up for it.

00:11:14 Michael Taylor

So I was surprised.

00:11:16 Michael Taylor

But that was very, that was sort of a huge big break.

00:11:22 Michael Taylor

And I think that often happens to be with oddly that the lighting designer, James Funken, who worked on that, he was saying he'd just had a big break that he'd done.

00:11:34 Michael Taylor

He was doing a show for, I've forgotten their name, Gecko Theatre Company.

00:11:41 Michael Taylor

And he said,

00:11:43 Michael Taylor

it was that one show that had suddenly brought him to public attention and sort of launched his career.

00:11:50 Michael Taylor

And in the same way, The Lady Killers suddenly launched my career and I was suddenly getting much better work, even though I had by that time been 25 years out of drama school and struggling all the time.

00:12:05 Michael Taylor

But since then, it's all felt a little bit more secure.

00:12:09 Nicole Julier-Goodwin

Yeah, I'm sure.

00:12:11 Nicole Julier-Goodwin

I know going, I know 100% going into this industry, it's going to be difficult.

00:12:15 Michael Taylor

It is very difficult.

00:12:16 Michael Taylor

Yeah.

00:12:20 Michael Taylor

And not getting easier.

00:12:21 Michael Taylor

But on the other hand, people have, you know, it's, there are still a lot of opportunities and in a way, you know, more opportunities because there's so much being done in television and streaming and filming and so on.

00:12:37 Nicole Julier-Goodwin

Yes, absolutely.

00:12:41 Nicole Julier-Goodwin

I'm going to skip the next question because you've already answered that in one of your previous slides.

00:12:49 Nicole Julier-Goodwin

So what skills do you think are the most important to set designers to help?

00:12:55 Michael Taylor

Well, the most important for me is model making for set design.

00:13:05 Michael Taylor

I think it really helps if you enjoy model making.

00:13:10 Michael Taylor

My process tends to be that I make a, I make a, basically I get the ground plan and work out on the ground plan where I want the actors to be, and then start imagining where the set can be in relation to them and what it needs to do.

00:13:32 Michael Taylor

And then I make a lot of rough models.

00:13:38 Michael Taylor

And so that probably by the time I first show something to the director, it might be the third or 4th version of the model that I've already done.

00:13:52 Michael Taylor

And then sort of in a good meeting, we'll then possibly chop up the model and alter it and stick it back together so that then he's happy with it.

00:14:04 Michael Taylor

Or it may be that he'll just not like it at all and then

00:14:08 Michael Taylor

I'll come back with something else.

00:14:11 Michael Taylor

But there's the idea of them.

00:14:15 Michael Taylor

I worked for a designer called who used to work at a who used to teach at Motley, the design school.

00:14:26 Michael Taylor

And she said when she was teaching, she would always say, the main person the model is for is for you.

00:14:34 Michael Taylor

It is for the designer to see what they've done and what they're doing and so on.

00:14:39 Michael Taylor

And after that, it's for the director and the actors, the workshop and the lighting designer and production staff and everyone.

00:14:48 Michael Taylor

But mainly it's for you to see what you're creating.

00:14:55 Michael Taylor

I suppose at the time that was done, it was before 3D realisation, which

00:15:04 Michael Taylor

And so it may well be that, other people may say, actually, if you can do that, you don't need to do the model.

00:15:13 Michael Taylor

Personally, I've never, because the CAD programme I use is 2D, 3D.

00:15:19 Michael Taylor

I've never got into 3D stuff at all.

00:15:23 Michael Taylor

And so I just like to use a model.

00:15:27 Michael Taylor

But also I think talking to directors, I think they like to have a physical model.

00:15:34 Michael Taylor

particularly Nikolai Foster at Leicester Curve, who I work with a bit.

00:15:43 Michael Taylor

He likes to go through the show in front of the model and sort of put out the furniture and the model people at quite an early, you know, at the stage of the white card model.

00:16:04 Michael Taylor

and just take a photograph of each scene and say, well, that's how we could do that and that's how we could do that.

00:16:10 Michael Taylor

And you can't do that really with a 3D version.

00:16:15 Michael Taylor

You do need something.

00:16:18 Michael Taylor

And also it sort of, it stimulates your imagination.

00:16:22 Michael Taylor

I think the fact that it is physical and the fact that you can cut it up or just move bits,

00:16:30 Michael Taylor

I think it's a much more creative process than that 3D thing.

00:16:35 Michael Taylor

Obviously, if the director was also had the skill to sit down and manipulate the 3D version, then he could.

00:16:45 Michael Taylor

But I don't.

00:16:47 Michael Taylor

But they don't.

00:16:48 Michael Taylor

Well, then there's no reason why they would.

00:16:52 Nicole Julier-Goodwin

No, that's fair.

00:16:53 Michael Taylor

That's.

00:16:53 Michael Taylor

So I think a natural 3D model will always be the thing.

00:16:58 Michael Taylor

So the more

00:17:00 Michael Taylor

The quicker, the quicker and more accurate you are at making a model, the better.

00:17:06 Nicole Julier-Goodwin

Yes, I would agree 100%.

00:17:09 Nicole Julier-Goodwin

That's essentially what my dissertation is figuring out is the bonuses of a handmade physical version compared to that of a digital version and then also 3D printed elements.

00:17:25 Michael Taylor

Yes.

00:17:26 Nicole Julier-Goodwin

Yeah.

00:17:27 Nicole Julier-Goodwin

And basically seeing which one's benefits lies where.

00:17:30 Nicole Julier-Goodwin

Essentially.

00:17:30 Nicole Julier-Goodwin

Yeah.

00:17:34 Nicole Julier-Goodwin

And then the last generic question is for an upcoming production of Blank by Alice Birch.

00:17:43 Nicole Julier-Goodwin

My.

00:17:43 Michael Taylor

Is that a real that is an existing play?

00:17:46 Nicole Julier-Goodwin

Yes.

00:17:48 Nicole Julier-Goodwin

Blank.

00:17:48 Nicole Julier-Goodwin

Thank you.

00:17:50 Michael Taylor

I thought maybe you just hadn't filled it in.

00:17:53 Nicole Julier-Goodwin

No, I it's when I first got handed the script, I was like.

00:17:58 Nicole Julier-Goodwin

Do we just not get to know the name?

00:18:00 Nicole Julier-Goodwin

Like what's what's going on here?

00:18:04 Nicole Julier-Goodwin

But for that show, my role is designer assistant.

00:18:09 Nicole Julier-Goodwin

As a set designer, would you have any advice for what you have often expected of that role?

00:18:18 Michael Taylor

Well, personally, I've normally I've only wanted assistance to to help with the model.

00:18:28 Michael Taylor

I think occasionally I might have asked for some research, but hardly ever.

00:18:37 Michael Taylor

So normally it's just please help make this model.

00:18:44 Michael Taylor

So yeah, I think it is just just that.

00:18:48 Michael Taylor

But I know other people do use assistance for for much more, you know,

00:18:57 Michael Taylor

designers who, if they're double booked, then you ask an assistant to go and sit through the tech or even the whole production.

00:19:07 Michael Taylor

And I'd occasionally did that for John Gunton to go and sit through the tech and be on the spot and be him.

00:19:18 Michael Taylor

But I've never been that double booked.

00:19:24 Nicole Julier-Goodwin

Hopes to the future.

00:19:25 Nicole Julier-Goodwin

Hopes to the future.

00:19:26 Nicole Julier-Goodwin

Yes, indeed.

00:19:27 Michael Taylor

Definitely.

00:19:32 Nicole Julier-Goodwin

OK, so you've already answered the next question as well, which is fantastic.

00:19:40 Nicole Julier-Goodwin

With physical models, I'm pretty sure I know what the answer will be, but what scale do you generally work with?

00:19:48 Michael Taylor

1 to 25.

00:19:51 Michael Taylor

Whereas John Gunter worked to 1 to 50.

00:19:54 Nicole Julier-Goodwin

Wow.

00:19:54 Michael Taylor

Because he did a lot of opera.

00:19:58 Michael Taylor

And actually, at the last thing I did with him, he was getting Alzheimer's and he did the model at 1 to 200 because he had misunderstood the scale on his on his scale rule, which was, yeah, we so we took this model

00:20:23 Michael Taylor

which was this size, to St.

00:20:26 Michael Taylor

Petersburg for a meeting.

00:20:29 Michael Taylor

It was in the opera house.

00:20:32 Michael Taylor

And they sent a transit fan to collect the model from the airport.

00:20:38 Michael Taylor

Oh, that is incredible.

00:20:44 Nicole Julier-Goodwin

I'm sure the laughs that came from that were.

00:20:46 Michael Taylor

Yes, Well, except for him, obviously, it was rather awkward because he...

00:20:51 Michael Taylor

When he was told it was actually 1 to 200, he said, I don't understand it.

00:20:56 Michael Taylor

Everybody seems to be too big.

00:20:59 Michael Taylor

But so it was all a bit.

00:21:02 Michael Taylor

It was he was in a great state of confusion.

00:21:07 Michael Taylor

But no, I know he does.

00:21:09 Michael Taylor

He used to do 150 big and then his room, his work room had all these absolutely beautiful 1 to 50 models along.

00:21:18 Nicole Julier-Goodwin

Gorgeous.

00:21:19 Michael Taylor

Fantastic.

00:21:21 Michael Taylor

Yeah.

00:21:24 Nicole Julier-Goodwin

That's incredible.

00:21:25 Nicole Julier-Goodwin

Yeah, I know that for some things that I have done for like a TV based model, it's been one to 10.

00:21:35 Michael Taylor

What?

00:21:36 Nicole Julier-Goodwin

Yeah, which was quite a shock being like, oh, well, I know how long things take me when I'm doing it 1 to 25, not a problem.

00:21:45 Nicole Julier-Goodwin

And then being told, can you do it 1 to 10?

00:21:47 Nicole Julier-Goodwin

It's like, yeah.

00:21:50 Nicole Julier-Goodwin

but it takes a lot longer.

00:21:53 Michael Taylor

Yes.

00:21:53 Michael Taylor

Is that common in TV to have one to 10?

00:21:56 Nicole Julier-Goodwin

I'm not sure, to be honest.

00:22:01 Nicole Julier-Goodwin

I think it is though, from the fact that my lecturer was like, since we're doing TV and film, let's do one to 10 so that we can get more detail on it and be able to see far closer on it.

00:22:12 Michael Taylor

Yes.

00:22:12 Nicole Julier-Goodwin

And it also allowed us to be able to like use the cameras on our phones.

00:22:18 Nicole Julier-Goodwin

And be able to like preview where we would do like specific shots in the actual sets.

00:22:24 Michael Taylor

Wow.

00:22:25 Michael Taylor

Yes.

00:22:25 Michael Taylor

Oh, well, how interesting.

00:22:27 Nicole Julier-Goodwin

Yeah.

00:22:30 Nicole Julier-Goodwin

Incredible.

00:22:31 Nicole Julier-Goodwin

Let's see.

00:22:34 Nicole Julier-Goodwin

How often would you say that you work with models?

00:22:41 Michael Taylor

Well, always.

00:22:42 Michael Taylor

Yeah.

00:22:45 Nicole Julier-Goodwin

Yeah.

00:22:46 Michael Taylor

Yes, I've never done one without a model.

00:22:53 Michael Taylor

Yes, it would be quite worrying not to.

00:22:58 Michael Taylor

Yeah.

00:23:01 Nicole Julier-Goodwin

Incredible.

00:23:09 Nicole Julier-Goodwin

How, for you personally, how early on in the design process do you start creating the model?

00:23:21 Michael Taylor

Quite early on.

00:23:22 Michael Taylor

Normally, I generally there's some sort of meeting with the director before it, before.

00:23:30 Michael Taylor

And then the next meeting, I always take something.

00:23:38 Michael Taylor

So that is something to something to talk about.

00:23:46 Michael Taylor

So a big it's a very it's a very early thing.

00:23:52 Michael Taylor

Yeah, I mean talking of in going back to the question before there was one of the things I.

00:24:00 Michael Taylor

What I did was this time last year I did Wiki in Sao Paulo.

00:24:07 Michael Taylor

And the that was a very peculiar thing because the producers didn't.

00:24:17 Michael Taylor

A lot of the show was a lot about the show was terrific except for the producers who were basically trying to save money at any possible time and.

00:24:29 Michael Taylor

So I went out on a first visit in early, it was on in February.

00:24:38 Michael Taylor

I went out in December with a white card model with the idea that I got to bring it back and paint it.

00:24:48 Michael Taylor

And actually then the director changed so much of it that it all needed to be rebuilt.

00:24:57 Michael Taylor

But the

00:24:59 Michael Taylor

producers didn't really want to see it again.

00:25:01 Michael Taylor

They wanted to know what colour everything was going to be, but they said, just send us the colours and the drawings.

00:25:10 Michael Taylor

We don't need to see a model.

00:25:12 Michael Taylor

And I said, well, I need to see a model and I'm going to bring a model when I come back out in February because we have to have a model.

00:25:23 Michael Taylor

So I turned up again with this enormous model into two huge suitcases.

00:25:29 Michael Taylor

And they genuinely didn't want to see it.

00:25:34 Michael Taylor

So I unpacked it onto a production desk in the theatre and it was never put together.

00:25:40 Michael Taylor

It was useful for all the bits of it.

00:25:43 Michael Taylor

I said, well, can we send this to the workshop?
00:25:45 Michael Taylor
And they said, well, they know what colour it is.
00:25:49 Michael Taylor
And there was a sort of complete failure to engage with anything.
00:25:58 Michael Taylor
that I was expecting.
00:26:00 Michael Taylor
And it was really disappointing, partly because, I mean, Brazil has fantastic craftsmen,
fantastic workshops, and so on.
00:26:08 Michael Taylor
It's just art workshops, but those workshops, they were very cheap.
00:26:14 Michael Taylor
They just wanted to know what colour it was and then to paint it.
00:26:21 Michael Taylor
So it was, but it was, I mean, it was a, I should have seen it as a real red.
00:26:26 Michael Taylor
They didn't work hard.
00:26:31 Michael Taylor
I mean, there was nothing to be done about it, but it just didn't.
00:26:34 Michael Taylor
It's not helpful.
00:26:37 Nicole Julier-Goodwin
No, I don't think I couldn't imagine.
00:26:42 Nicole Julier-Goodwin
Only wanting the color.
00:26:44 Nicole Julier-Goodwin
Yeah, for that.
00:26:47 Michael Taylor
Oh, it was awful.
00:26:47 Michael Taylor
And then the author of Wiki derived from New York and he said he thought it should be a bit
brighter.
00:26:57 Michael Taylor
He'd like it to a slightly more cheerful colour.
00:27:00 Michael Taylor
And so they then said, well, you need to quickly pick a new colour.
00:27:05 Michael Taylor
And so, and here's a chart.
00:27:09 Michael Taylor
So I had a look at the chart and then I said, well, I think it should be this.
00:27:13 Michael Taylor
And they said, don't worry at all.
00:27:15 Michael Taylor
Somebody in the office has picked a colour.
00:27:18 Michael Taylor
And it was the administrator in the office had picked a cheerful colour.
00:27:25 Michael Taylor
And so it was.
00:27:28 Michael Taylor

That's one reason why there are no pictures of Wicked on my website.

00:27:34 Nicole Julier-Goodwin

Fair enough.

00:27:34 Nicole Julier-Goodwin

Fair enough.

00:27:38 Nicole Julier-Goodwin

That is.

00:27:40 Michael Taylor

That is crazy.

00:27:42 Michael Taylor

Yeah, it was completely, completely mad.

00:27:45 Nicole Julier-Goodwin

Giving, giving the impression they didn't want the shine.

00:27:47 Michael Taylor

I think we needed to know the colour.

00:27:49 Michael Taylor

She picked a good one.

00:27:53 Nicole Julier-Goodwin

That is that is something.

00:27:59 Michael Taylor

Yes, it was very, very big show.

00:28:01 Michael Taylor

It's just weird that they didn't take it slightly more seriously.

00:28:06 Nicole Julier-Goodwin

Yeah, that's true.

00:28:09 Nicole Julier-Goodwin

After a show is finished, what do you tend to do with the physical model?

00:28:18 Michael Taylor

It tends to hang about for a bit.

00:28:22 Michael Taylor

It is a big problem what to do with the model.

00:28:26 Michael Taylor

I was recently consulted by the friend, by a friend of a designer called Robin Don, because who did, it was a fantastic design, did a lot of operas and they didn't know what to do with his models.

00:28:45 Michael Taylor

And eventually his family took his models because he had just died.

00:28:52 Michael Taylor

And sorry, I should write this of crucial detail, didn't mention it.

00:29:00 Michael Taylor

Yes, he died.

00:29:01 Michael Taylor

What do you do with his models?

00:29:03 Michael Taylor

And exactly the same happened with Jane Gunter, who I worked for.

00:29:07 Michael Taylor

Who, when he, at the end of his life, he needed to move to a smaller house and his wife were looking for what could they do with his models.

00:29:21 Michael Taylor

And they, I think the Victoria and Albert too, and a lot of them were just thrown away.

00:29:28 Michael Taylor

And it seemed a shame that it's stored these things from, which were wonderful records of really important productions from the 1970s and 80s and 90s, and that they were getting chucked away.

00:29:43 Michael Taylor

And they were only one to 50, so actually they weren't a big problem to store.

00:29:48 Michael Taylor

Whereas

00:29:51 Michael Taylor

What I've found is after you've hung on to it for about 5 or 10 years, if you look at it again, it's generally looking tatty enough that you don't mind throwing it away at that stage.

00:30:07 Nicole Julier-Goodwin

That makes sense.

00:30:08 Michael Taylor

Yeah, there's, it sort of has its own, you know, the glue starts going and things start peeling off or getting bent or

00:30:19 Michael Taylor

falling to bits and you think, actually, nobody's ever going to want to do it again.

00:30:24 Michael Taylor

But it's hard because when you first make it, is actually, I mean, I always think the thing I make is the model.

00:30:33 Michael Taylor

Everything else is sort of ancillary to that.

00:30:38 Michael Taylor

But actually, my creative work is I've made this model and that's

00:30:45 Michael Taylor

But that's what it is, and it's in shape.

00:30:49 Michael Taylor

There you go.

00:30:51 Michael Taylor

I mean, I think you take, if you take nice photographs of it, then that then becomes, you know, you've got a good record of it.

00:31:01 Michael Taylor

But it's always very painful throwing, throwing a model away.

00:31:07 Michael Taylor

I wish there was some useful place to put.

00:31:11 Michael Taylor

I mean, I

00:31:14 Michael Taylor

I'm a member of the Society of British Theatre Designers, and when the rub is done, I put the I put a question in there.

00:31:24 Michael Taylor

Did anyone have a good idea for what could be done with the old models?

00:31:29 Michael Taylor

And but there was no answer to it.

00:31:33 Nicole Julier-Goodwin

Yeah, it's it's very much from having done this.

00:31:38 Nicole Julier-Goodwin

I've very much found it's

00:31:40 Nicole Julier-Goodwin

It's very much a grey area in the sense of people don't want to almost talk about it or think about it very much.

00:31:47 Nicole Julier-Goodwin

They very much want to be like, no, I'll, I'm going to keep them for as long as possible.

00:31:54 Michael Taylor

Yes.

00:31:55 Michael Taylor

Yeah.

00:31:55 Nicole Julier-Goodwin

And yeah.

00:31:57 Michael Taylor

And I mean, and I do keep them through the salons, but you know, so I've got models in sort of, they sort of go to, you can dismantle them and put them in boxes.

00:32:09 Michael Taylor

But the fact of having done that sort of means you're never really going to put it together again.

00:32:14 Nicole Julier-Goodwin

Yeah.

00:32:16 Michael Taylor

So yeah, there isn't a nice answer.

00:32:19 Nicole Julier-Goodwin

No, unfortunately there's not.

00:32:21 Nicole Julier-Goodwin

No.

00:32:24 Nicole Julier-Goodwin

Yeah.

00:32:24 Nicole Julier-Goodwin

So it's why when I'm looking at like the costing and sustainability of physical models, I'm like, how much material has then been used in that model?

00:32:33 Nicole Julier-Goodwin

And then

00:32:34 Nicole Julier-Goodwin

You've then got to think of whether that all of the material you've used is recyclable or not.

00:32:39 Nicole Julier-Goodwin

And then a lot of maths.

00:32:45 Michael Taylor

Yes, I mean, though, I mean, the fact of the model and all the models that led up to the model, all the white card models, they have hopefully saved a lot of wasted time and energy and materials by making sure that whatever you end up with.

00:33:04 Michael Taylor

is the most efficient, effective solution to the thing.

00:33:10 Michael Taylor

So I think there's a justification for.

00:33:13 Nicole Julier-Goodwin

Oh, absolutely.

00:33:14 Nicole Julier-Goodwin

Yes.

00:33:16 Nicole Julier-Goodwin

It's I'm finding it's very difficult doing this topic because it's the point of it.

00:33:25 Nicole Julier-Goodwin

Initially I was like, one or the other.

00:33:28 Nicole Julier-Goodwin

And I'm like, well, it can't be.

00:33:30 Nicole Julier-Goodwin

It physically can't be one or the other.

00:33:32 Nicole Julier-Goodwin

Like it's got to be like,

00:33:35 Nicole Julier-Goodwin

all of it together with where certain things are applicable.

00:33:39 Michael Taylor

Yes, when you say one or the other, one or the other, what?

00:33:43 Nicole Julier-Goodwin

Initially, it was going to be either a physical handmade model or a digitally modeled and then 3D printed model.

00:33:55 Michael Taylor

Yes.

00:33:56 Nicole Julier-Goodwin

But it just the 3D printed model was just not completely

00:34:02 Nicole Julier-Goodwin

completely inviable.

00:34:03 Nicole Julier-Goodwin

It could, it wouldn't work because the amount of time that printing the entire model would have taken from a 3D printer, by that point you would have completely finished a full, a completely full model in physical handmade form, which was just

00:34:27 Nicole Julier-Goodwin

Crazy time wise.

00:34:29 Nicole Julier-Goodwin

Absolutely.

00:34:30 Michael Taylor

Yes, that that's interesting because I, if I could do 3D, if I could do 3D drawing, then I would be quite interested in getting things 3D printed.

00:34:45 Michael Taylor

And I mean that for a show I did recently, I needed, I got some pillars 3D printed and if I could actually do the whole

00:34:58 Michael Taylor

thing in 3D, it would be, I mean, I know there are designers who get their models 3D printed, but is it very time consuming?

00:35:09 Nicole Julier-Goodwin

It's fairly, like quite a lot time consuming if I very quickly grab these.

00:35:18 Nicole Julier-Goodwin

are on, I haven't fully finished cleaning them up yet, but

00:35:27 Nicole Julier-Goodwin

Yeah, this is part of.

00:35:29 Nicole Julier-Goodwin

Ohh, is it gonna?

00:35:31 Nicole Julier-Goodwin

There we go.

00:35:32 Nicole Julier-Goodwin

If I hold it in front, this is part of a 3D printed element of a set that I'm doing currently and they took.

00:35:47 Nicole Julier-Goodwin

They were printed in two parts as well, so they're detachable from each other, but they took.

00:35:55 Nicole Julier-Goodwin

Something like a day each to print.

00:35:58 Michael Taylor

Wow.

00:35:58 Nicole Julier-Goodwin

An entire day.

00:36:01 Nicole Julier-Goodwin

Whereas when I was physically like hand.

00:36:07 Nicole Julier-Goodwin

Making it for a physical model in that one day I was able to then instead create all of the ones that I needed.

00:36:17 Nicole Julier-Goodwin

Yes.

00:36:19 Nicole Julier-Goodwin

Rather than just a singular one.

00:36:22 Nicole Julier-Goodwin

So I think there are very much elements of 3D printed is 100% useful in some aspects, whereas physical is also still so necessary.

00:36:36 Nicole Julier-Goodwin

And I don't think we're going to get to a point where one is more important than the other or one is going to kill the other.

00:36:43 Nicole Julier-Goodwin

I think it's definitely going to become like a joint thing, I reckon, hopefully.

00:36:52 Michael Taylor

Yes.

00:36:54 Michael Taylor

I mean, on some things, where I think it's going to be tough is if designers are able to produce the instructions for the 3D model, they, in a way, would save, I mean, it would save assistance.

00:37:18 Michael Taylor

But that's getting tough for the people who want to be the assistants.

00:37:22 Michael Taylor

So that job then might be to take the designer's drawing and create the drawing from which the 3D model, the 3D printing can be done.

00:37:34 Nicole Julier-Goodwin

And because...

00:37:36 Nicole Julier-Goodwin

Oh, you go.

00:37:37 Nicole Julier-Goodwin

Sorry.

00:37:38 Michael Taylor

No, I was just going to say, I mean, although it may have taken a day, during that day at least you didn't have to do it, you could do something else.

00:37:45 Nicole Julier-Goodwin

You could be doing connection.

00:37:48 Nicole Julier-Goodwin

100%.

00:37:49 Nicole Julier-Goodwin

That was that is something that is going for the 3D printing.

00:37:53 Nicole Julier-Goodwin

It's the fact that I can, as a general rule, I can set it going and then I can go and get on with something else in that time.

00:38:02 Nicole Julier-Goodwin

And as long as the print actually works and doesn't break, it's incredible.

00:38:09 Michael Taylor

Yes.

00:38:09 Michael Taylor

Is it strong enough?

00:38:12 Nicole Julier-Goodwin

It's actually it's quite strong.

00:38:13 Nicole Julier-Goodwin

Like it's not.

00:38:16 Nicole Julier-Goodwin

It's because it's got a lot of infill in it and you can choose how much you actually put in there.

00:38:23 Nicole Julier-Goodwin

You can make it as strong as you want it to be, basically.

00:38:27 Nicole Julier-Goodwin

So if you want it to be something that someone just looks at and wouldn't touch, but you want it quickly, you can reduce the amount of infill in it so that it would not only be lighter, but it would also still look right, but just be quicker to create.

00:38:44 Michael Taylor

Yeah.

00:38:46 Nicole Julier-Goodwin

But then these ones that I've got here, the infill is a lot thicker on them because I wanted them to be able to be heldable and actually interacted with.

00:38:57 Michael Taylor

Yeah.

00:38:58 Michael Taylor

But if you then decided you wanted to alter it slightly, can you cut it and stick it back together?

00:39:06 Nicole Julier-Goodwin

Or is that not easily?

00:39:10 Nicole Julier-Goodwin

You can in some aspect.

00:39:14 Nicole Julier-Goodwin

So you can

00:39:17 Nicole Julier-Goodwin

You can cut it, but the problem is because it's not solid on the inside, you get the edge ends up looking like the infill.

00:39:28 Nicole Julier-Goodwin

So it will look like the pattern of the infill.

00:39:30 Nicole Julier-Goodwin

Whether that is, you can choose what it will look like, the infill.

00:39:35 Nicole Julier-Goodwin

But sometimes it will just be crisscross lines.

00:39:40 Nicole Julier-Goodwin

which would then be very difficult to smooth.

00:39:43 Nicole Julier-Goodwin

Not impossible.

00:39:45 Nicole Julier-Goodwin

You could use excess plastic, heat it up and then sort of manually smooth it on.

00:39:53 Nicole Julier-Goodwin

But unfortunately, most of the time, if a model goes incorrectly or if you want to change a model, the model just has to be binned, unfortunately.

00:40:04 Michael Taylor

Yes.

00:40:05 Nicole Julier-Goodwin

And it's like looking at something I've found while looking into researching into a lot of this is that some companies, there are some companies that offer taking your 3D prints and then they will cut them down and try and recreate them into more filament to be able to be reused, which is great and adds like a sustainable option to it.

00:40:29 Nicole Julier-Goodwin

But it's not a widely accessible thing at the moment, which is a shame.

00:40:33 Michael Taylor

Yes,

00:40:36 Michael Taylor

Gosh.

00:40:37 Nicole Julier-Goodwin

Yeah.

00:40:37 Michael Taylor

Interesting.

00:40:38 Michael Taylor

Yeah.

00:40:40 Nicole Julier-Goodwin

Anyway, moving on to the last few questions very quickly.

00:40:46 Nicole Julier-Goodwin

You mentioned that you have got a 2D modeling software that you use.

00:40:51 Nicole Julier-Goodwin

Was it 2D and 3D or just 2D?

00:40:54 Michael Taylor

It's a it's just a 2D CAD program called Visual CAD.

00:41:01 Nicole Julier-Goodwin

Visual CAD.

00:41:01 Nicole Julier-Goodwin

OK.

00:41:02 Michael Taylor

There's a designer called Sean Kavanagh who may possibly have, I don't know if he's now retired because he was slightly older than me and he lived, he had a house near Abergavenny and he's and he started using this and it is very good programme.

00:41:26 Michael Taylor

It's much, much cheaper than AutoCAD.

00:41:29 Michael Taylor

And it's much, much quicker to learn than AutoCAD.

00:41:32 Michael Taylor

And he felt it was also quicker to use than AutoCAD, but it doesn't do anything 3D.

00:41:40 Michael Taylor

It is just for doing 2D stuff, which...

00:41:46 Michael Taylor

And so that's what I use.

00:41:49 Michael Taylor

And I mean, you can then save the drawings as DWGs or DXMs.

00:41:53 Nicole Julier-Goodwin

Yeah.

00:41:54 Nicole Julier-Goodwin

Well, that's always helpful then.

00:41:55 Nicole Julier-Goodwin

Yeah.

00:41:58 Nicole Julier-Goodwin

Incredible.

00:41:59 Nicole Julier-Goodwin

Thank you.

00:42:01 Nicole Julier-Goodwin

And then when it comes to 3D printing and 3D modeling, is there any other reasoning for why you choose not to use it or would prefer not to use it?

00:42:18 Michael Taylor

Would prefer not to use 3D printing.

00:42:22 Michael Taylor

Well, yeah.

00:42:23 Michael Taylor

What's what my.

00:42:25 Michael Taylor

process is that basically having worked out something roughly in 3D, I then draw it and then cut the drawings out and they become the so then the model is made from the drawings.

00:42:45 Michael Taylor

So I always know that the drawings are accurate.

00:42:53 Michael Taylor

Or at least the draw, I mean, I can see what the drawings are going to be in 3D.

00:42:58 Michael Taylor

And also if in the process of that I find there are problems, I can change that on the drawings.

00:43:05 Michael Taylor

And obviously if that was a 3D drawing and then I was getting it and then I was 3D printing from that, I suppose again, I'd know that is exactly what the drawing was.

00:43:18 Michael Taylor

But

00:43:21 Michael Taylor

But I wouldn't encounter what the problem was until it had created the whole thing, where I then might think, I wish I had discovered that halfway through and I'd have walked it and made it completely, you know, and so on.

00:43:39 Michael Taylor

So to that extent, it's quite useful if if you are also you get then an idea of what the workshop is going to have to build.

00:43:50 Michael Taylor

If you know that, you know, there's a flat surface and you're adding a bit to it and a bit to it and a bit to it, you're kind of in miniature doing what the workshop is going to have to do.

00:44:00 Nicole Julier-Goodwin

Yeah.

00:44:01 Michael Taylor

But if it's if it's a 3D print, then that's a whole completely different process.

00:44:11 Nicole Julier-Goodwin

Yeah, yeah.

00:44:14 Nicole Julier-Goodwin

No, that's that's very true.

00:44:19 Nicole Julier-Goodwin

And then lastly, is there any way in which you would consider using 3D printing or 3D modelling in the future?

00:44:29 Michael Taylor

Yes, there is.

00:44:30 Michael Taylor

I mean, if I suppose if I needed there are things of which which.

00:44:44 Michael Taylor

Which I suppose would be very handy to make to to 3D print things which have a lot of detail and a lot of unusual shapes in relation to the to the in relation to the overall size.

00:45:07 Michael Taylor

So yes, I suppose I would consider using 3D, but I do need to

00:45:13 Michael Taylor

I'd need to find someone who could do it and just say this needs 3D printing.

00:45:19 Michael Taylor

Here's here's a two.

00:45:21 Michael Taylor

Here are some 2D drawings of it and a rough white card model.

00:45:25 Michael Taylor

Can you can you turn that into a 3D thing?

00:45:34 Michael Taylor

So yes, but other things.

00:45:39 Michael Taylor

I mean, there are some things, like I've just done a production of sound music, which we need, I needed to make 17 model trees.

00:45:50 Michael Taylor

And I think that would, I mean, it was a bit of a slog anyway, but it would have been impossible to 3D print because I wouldn't have known how to, it would have been a hell of a lot of work to draw

00:46:08 Michael Taylor

All the wiggly twigs.

00:46:09 Michael Taylor

That's true.

00:46:12 Michael Taylor

Whereas if you're if you're making something out of wire, it sort of naturally has a shape to it and you can see what it is.

00:46:22 Michael Taylor

And also you're kind of not creating something that's meant to be an absolute.

00:46:30 Nicole Julier-Goodwin

Yeah.

00:46:31 Michael Taylor

You know, facsimile, you're you're doing something which people will recognise as a tree.

00:46:38 Michael Taylor

Actually.

00:46:41 Michael Taylor

Yeah.

00:46:41 Michael Taylor

So it was a lot easier to, in that case, to make it physically out of something wrong than try to tell a computer.

00:46:53 Nicole Julier-Goodwin

Yeah, absolutely.

00:46:55 Nicole Julier-Goodwin

That makes complete sense.

00:47:01 Nicole Julier-Goodwin

Well, fantastic.

00:47:02 Nicole Julier-Goodwin

That is all of my questions.

00:47:05 Michael Taylor

That was been very interesting.

00:47:07 Michael Taylor

So thank you.

00:47:09 Nicole Julier-Goodwin

That's all right.

00:47:10 Nicole Julier-Goodwin

Thank you for taking the time.

00:47:11 Nicole Julier-Goodwin

I do appreciate it.

00:47:13 Michael Taylor

Good luck with you with your project.

00:47:15 Nicole Julier-Goodwin

Thank you.

00:47:16 Nicole Julier-Goodwin

And was there anything else that you wanted to mention or talk about?

00:47:21 Michael Taylor

No, I think that's about it, really.

00:47:25 Michael Taylor

Yeah.

00:47:27 Nicole Julier-Goodwin

Fantastic.

00:47:27 Michael Taylor

So yeah, no good luck with you with your degree.

00:47:32 Nicole Julier-Goodwin

Thank you.

00:47:35 Nicole Julier-Goodwin

It's been lovely talking to you.

00:47:37 Michael Taylor

Well, thank you very much.

00:47:39 Nicole Julier-Goodwin

Thank you very much.

00:47:41 Michael Taylor

Bye bye.

00:47:42 Nicole Julier-Goodwin

Bye.

New Recording.m4a

A3 Transcript with Deryn Allen-Dyer

Participant name: Deryn Allen-Dyer

Role: Director

Date: 24/03/26

Method: In Person

00:00:01 Nicole Julier-Goodwin

Boom, there we go.

00:00:02 Nicole Julier-Goodwin

We are recording.

00:00:04 Nicole Julier-Goodwin

Back to the model for you.

00:00:05 Nicole Julier-Goodwin

There you go.

00:00:06 Nicole Julier-Goodwin

You talk with your heart's content.

00:00:08 Deryn Allen-Dyer

Okay.

00:00:09 Deryn Allen-Dyer

With the digital copy, I think that this is more, I won't say sustainable, but it's more allowing of creative freedom as you can quite literally do whatever you want.

00:00:22 Deryn Allen-Dyer

And there's not, like obviously I know that it takes like talent and skill to be able to do this and it's going to be very difficult to do this.

00:00:29 Deryn Allen-Dyer

But it's not as time consuming as, say, I didn't like this bit and I wanted that to change.

00:00:39 Deryn Allen-Dyer

On this it's a lot more like, okay, yeah, give me a second, give me like 5 minutes.

00:00:44 Deryn Allen-Dyer

Fixed it, is that better?

00:00:46 Deryn Allen-Dyer

Whereas for this, for the model making aspect, the one that you've made and cut out, that I would say, yeah, you know what, that would be relatively okay to do.

00:00:59 Deryn Allen-Dyer

It would be like, let me just go cut out some things and then I'll show you kind of.

00:01:03 Nicole Julier-Goodwin

Give me, give me an hour and I'll come back to you sort of.

00:01:05 Deryn Allen-Dyer

Yeah.

00:01:06 Deryn Allen-Dyer

Whereas 3D printed.

00:01:10 Deryn Allen-Dyer

Give me two working days and I'll get back to you.

00:01:15 Nicole Julier-Goodwin

That was going to take, if we reprinted that, it would take another 12 hours.

00:01:22 Deryn Allen-Dyer

For what is essentially.

00:01:26 Deryn Allen-Dyer

That and that.

00:01:28 Deryn Allen-Dyer

Which that I'm assuming took you what, 20 minutes?

00:01:31 Deryn Allen-Dyer

No, I don't mean like the whole thing.

00:01:33 Deryn Allen-Dyer

I don't mean the whole thing.

00:01:34 Nicole Julier-Goodwin

You mean assembling it together?

00:01:35 Deryn Allen-Dyer

I mean like this on its own.

00:01:37 Deryn Allen-Dyer

Like if you were making that here.

00:01:39 Nicole Julier-Goodwin

Yeah.

00:01:40 Deryn Allen-Dyer

I don't think it would have taken you that long.

00:01:42 Nicole Julier-Goodwin

It wouldn't take me 12 hours to do that, no.

00:01:44 Nicole Julier-Goodwin

It would take me...

00:01:44 Nicole Julier-Goodwin

I'm trying to think of how long it took me.

00:01:49 Nicole Julier-Goodwin

I made a note of this and the numbers come from my head.

00:01:52 Nicole Julier-Goodwin

I think that one took me two hours to do.

00:01:55 Deryn Allen-Dyer

The whole thing.

00:01:56 Nicole Julier-Goodwin

Not the whole thing.

00:01:58 Nicole Julier-Goodwin

That specifically, like that whole thing together.

00:02:01 Deryn Allen-Dyer

That whole thing.

00:02:01 Deryn Allen-Dyer

No, but I mean like just this box.

00:02:06 Nicole Julier-Goodwin

Oh, just the box.

00:02:07 Deryn Allen-Dyer

Like this.

00:02:08 Deryn Allen-Dyer

Like basically without the like, because I know that you've indeed like you've indented it.

00:02:14 Deryn Allen-Dyer

This in comparison to how it takes you to do that without the indent and detail and because this does not have detail.

00:02:23 Deryn Allen-Dyer

I know that it was like 20 minutes.

00:02:25 Deryn Allen-Dyer

That's why I said 20 minutes.

00:02:26 Deryn Allen-Dyer

I was right.

00:02:27 Nicole Julier-Goodwin

Yeah.

00:02:30 Deryn Allen-Dyer

But this in a world where- To be honest.

00:02:32 Nicole Julier-Goodwin

Probably even 5 minutes.

00:02:34 Deryn Allen-Dyer

This in a world where time is money in an industry where time is money is not sustainable.

00:02:43 Nicole Julier-Goodwin

No.

00:02:43 Deryn Allen-Dyer

If you had, and obviously I know that this is a difficult situation for you because obviously like it didn't work properly, I know like it's literally

00:02:52 Deryn Allen-Dyer

A chunk just fell out of my hand.

00:02:54 Nicole Julier-Goodwin

It's all good, put it on the pile, just measure it sort of thing.

00:02:57 Deryn Allen-Dyer

But basically, in a world where a lot of things are digitalised anyway, scripts are digitalised, music sheets are digitalised, why not allow the set to be digitalised?

00:03:08 Deryn Allen-Dyer

I feel like that's an okay thing.

00:03:10 Deryn Allen-Dyer

Yes, does it take away the little bit of the magic for like some of the actors that like, oh, I want to see the pretty set, but I feel like still model making is still better than the potential 3D version.

00:03:21 Deryn Allen-Dyer

Because also you've got to think, this is an incredible amount of plastic.

00:03:25 Deryn Allen-Dyer

That in retrospect, I'm trying to think how many grams that was.

00:03:29 Nicole Julier-Goodwin

That would be.

00:03:29 Deryn Allen-Dyer

Like how, in the nicest way possible, with this plastic?

00:03:35 Nicole Julier-Goodwin

It can't be recycled.

00:03:36 Deryn Allen-Dyer

It can't be recycled.

00:03:37 Nicole Julier-Goodwin

Not really.

00:03:38 Deryn Allen-Dyer

But it can, but.

00:03:39 Nicole Julier-Goodwin

It's very difficult in the UK to reuse it.

00:03:44 Deryn Allen-Dyer

How often is it going to get used?

00:03:46 Nicole Julier-Goodwin

Once for the show.

00:03:47 Deryn Allen-Dyer

Once for the show and then potentially.

00:03:50 Nicole Julier-Goodwin

If there's anything similar, you show it, but they might want it changed, but you would then not use it again for them.

00:03:56 Deryn Allen-Dyer

So unless you're showing it as a portfolio piece, which I get, but you can still get the same result from a digital copy or you can get the same result from model making.

00:04:08 Deryn Allen-Dyer

So personally, out of all three options that are sat in front of me right now, this instills a little magic.

00:04:17 Nicole Julier-Goodwin

That's how long it would take to 3D print that whole thing.

00:04:20 Nicole Julier-Goodwin

Not including this, actually.

00:04:22 Nicole Julier-Goodwin

Not including that.

00:04:22 Deryn Allen-Dyer

Not including that, so just like the buildings.

00:04:24 Nicole Julier-Goodwin

Just the buildings, not including the space.

00:04:27 Deryn Allen-Dyer

You'd be working.

00:04:28 Nicole Julier-Goodwin

In 16 days, you could do this model in quicker than 16 days.

00:04:34 Deryn Allen-Dyer

You could do that if you were like pushing yourself.

00:04:37 Deryn Allen-Dyer

Two days.

00:04:39 Deryn Allen-Dyer

Two days.

00:04:41 Deryn Allen-Dyer

Why would you do it less than that if you're like allowing yourself to like have rest breaks?

00:04:51 Nicole Julier-Goodwin

To do the detail on this, I would probably say 3 days, to be honest, to do all of them.

00:04:58 Deryn Allen-Dyer

Yeah.

00:04:58 Nicole Julier-Goodwin

Because it's the actual card, like putting, sticking it together quick.

00:05:05 Nicole Julier-Goodwin

Getting the details.

00:05:05 Deryn Allen-Dyer

No, I mean, is it like you would digitalise it?

00:05:08 Deryn Allen-Dyer

Yeah.

00:05:08 Nicole Julier-Goodwin

Two days.

00:05:09 Deryn Allen-Dyer

That's what I said, two days in the sense of like, that, would take longer because you've got to think, stick, take off, so yeah, three days.

00:05:17 Deryn Allen-Dyer

But 16 days is an egregious amount of time.

00:05:21 Deryn Allen-Dyer

So if I were, if I were, if I were, you know, putting on a 317 grams of plastic that will never be reused again.

00:05:35 Deryn Allen-Dyer

That can't be reused again.

00:05:37 Nicole Julier-Goodwin

Nope.

00:05:38 Deryn Allen-Dyer

So in a world where money is king, time is money, pollution and plastic is becoming an incredible issue.

00:05:50 Deryn Allen-Dyer

If I was putting on my plate in a real environment, it was for real happening and it's being put on, it's professionally done, I have a cast, I have a whole creative team, would I want a plastic

00:06:09 Deryn Allen-Dyer

Model, maybe for safekeepings and having a cute little like, this is a show that I directed and having a keepsake, but I don't want an entire model.

00:06:20 Nicole Julier-Goodwin

Something like that is essentially a 3D, just a plastic block, but it is the size of a steel decking.

00:06:29 Deryn Allen-Dyer

Sorry, I don't know why I hit it.

00:06:31 Nicole Julier-Goodwin

It's like a little brick.

00:06:32 Nicole Julier-Goodwin

Yeah.

00:06:33 Nicole Julier-Goodwin

That's the sort of thing that you would be able to reuse from set to show.

00:06:37 Deryn Allen-Dyer

That, yes.

00:06:38 Deryn Allen-Dyer

I see that being reused quite often.

00:06:40 Deryn Allen-Dyer

But this?

00:06:42 Deryn Allen-Dyer

No.

00:06:44 Deryn Allen-Dyer

Would I want to keep a model of every show that I did?

00:06:46 Deryn Allen-Dyer

Yes.

00:06:47 Deryn Allen-Dyer

Would I have a space?

00:06:48 Deryn Allen-Dyer

No.

00:06:49 Deryn Allen-Dyer

Would I want to keep the models?

00:06:51 Deryn Allen-Dyer

Yes, because they look cool.

00:06:52 Deryn Allen-Dyer

And like I said, this, like the model here,
00:06:57 Deryn Allen-Dyer
This is bringing back like Action Kid in me.
00:06:59 Deryn Allen-Dyer
Oh look at it, it's so pretty, it's made, it's oh my goodness, it's pretty.
00:07:04 Deryn Allen-Dyer
Like that's what I'm getting from it.
00:07:05 Deryn Allen-Dyer
And I get a similar sense of it here.
00:07:09 Deryn Allen-Dyer
And I feel like this would be so useful, like in like future, I don't know where computers are at this point.
00:07:18 Deryn Allen-Dyer
I'm the worst person with computers.
00:07:20 Deryn Allen-Dyer
But in the future,
00:07:22 Deryn Allen-Dyer
you could potentially have a walkthrough of what the set will look like.
00:07:26 Deryn Allen-Dyer
And you can- I've done that before.
00:07:28 Nicole Julier-Goodwin
Put it in a VR headset.
00:07:29 Deryn Allen-Dyer
Yeah, so that is something that this offers.
00:07:32 Deryn Allen-Dyer
And that then also shows the actors what it's going to look like.
00:07:36 Deryn Allen-Dyer
Even when construction hasn't started, they have an idea of the spacing they're going to have.
00:07:41 Deryn Allen-Dyer
They have an idea of the levels.
00:07:42 Deryn Allen-Dyer
They have an idea of, you know, if a choreographed dance was happening on here, which not saying that it's happening on here, but
00:07:52 Deryn Allen-Dyer
This can be reused.
00:07:53 Deryn Allen-Dyer
I think this is definitely something that would be reused for a lot of shows, especially if you have like an amphitheatre elementary show.
00:07:58 Deryn Allen-Dyer
This is something that definitely could be reused.
00:08:00 Deryn Allen-Dyer
If that was 3D printed and it was better quality than what that is, that I see getting reused quite a little bit.
00:08:08 Deryn Allen-Dyer
But for the most part, if you were doing a show and you want to show people how much they can move around on that, then yeah, I think that would be useful.
00:08:21 Deryn Allen-Dyer
Yeah, we can like get our fingers and we can do, do, do, do.
00:08:24 Nicole Julier-Goodwin
Careful with weight on the slopes because some of them aren't.

00:08:28 Deryn Allen-Dyer
I'm not putting any weight on my hand.

00:08:30 Deryn Allen-Dyer
I appreciate that.

00:08:35 Deryn Allen-Dyer
And then you go up another one.

00:08:37 Deryn Allen-Dyer
For the recording, I'm playing with my hand on the model that Nicole has offered me.

00:08:45 Deryn Allen-Dyer
I am so professional.

00:08:46 Nicole Julier-Goodwin
So in terms of

00:08:51 Nicole Julier-Goodwin
Initial models.

00:08:52 Nicole Julier-Goodwin
I'm going to make this very quick, Dora.

00:08:53 Nicole Julier-Goodwin
I can see the time.

00:08:55 Nicole Julier-Goodwin
In terms of initial models, when I had initially given you those physical ones to hold and you could move around, would you rather have been given the physical models that you could move around as I did or the digital?

00:09:09 Deryn Allen-Dyer
Me personally, as a human being, yes.

00:09:15 Deryn Allen-Dyer
I would much rather a physical model because I'm very tactile.

00:09:20 Deryn Allen-Dyer
I like to have things in front of me.

00:09:22 Deryn Allen-Dyer
This, great, because I can see it and I can, and I can, I wouldn't know how to move it.

00:09:28 Deryn Allen-Dyer
I wouldn't know how to think.

00:09:30 Deryn Allen-Dyer
But you might be with a director who is more tech savvy than me and has a background in set design and they're like, oh, CAD.

00:09:37 Nicole Julier-Goodwin
So as someone that's not tech savvy, does this being digital put you off from?

00:09:44 Deryn Allen-Dyer
No.

00:09:44 Nicole Julier-Goodwin
Trying to...

00:09:45 Deryn Allen-Dyer
No.

00:09:46 Deryn Allen-Dyer
I feel like I'd want a physical thing, but if you were like, this is all I have to offer, I'd be like, cool, show me how to move this thing so that I put it in the place where I want it.

00:09:55 Nicole Julier-Goodwin
Because it can be.

00:09:56 Nicole Julier-Goodwin
I'm not going to save this so that we don't lose this, but you can move it like that.

00:10:07 Deryn Allen-Dyer

Yeah.

00:10:07 Deryn Allen-Dyer

So if you were to sit down with your...

00:10:10 Deryn Allen-Dyer

your director in the future and sit there and show them how to move it around.

00:10:17 Nicole Julier-Goodwin

Interview professional.

00:10:19 Deryn Allen-Dyer

If you were to show them how to do all that stuff, then yeah, that would be really, really helpful.

00:10:24 Deryn Allen-Dyer

Personally, for me, I'm more tactile.

00:10:25 Deryn Allen-Dyer

That's just how I am.

00:10:27 Deryn Allen-Dyer

But that doesn't turn me off, this idea at all.

00:10:31 Deryn Allen-Dyer

It makes me quite excited about that and what the future of technology can hold.

00:10:36 Deryn Allen-Dyer

Maybe it's traditionalism.

00:10:37 Deryn Allen-Dyer

Model making.

00:10:39 Deryn Allen-Dyer

Slightly bit of like traditional acting brain going on there.

00:10:43 Nicole Julier-Goodwin

I don't think traditional is ever going to go out, to be honest.

00:10:46 Deryn Allen-Dyer

I don't think it should.

00:10:47 Nicole Julier-Goodwin

No.

00:10:47 Deryn Allen-Dyer

I don't think it should.

00:10:48 Nicole Julier-Goodwin

I think at the very least, at the very most, if this were to almost take over, it would very much be physical rough versions and then final versions on this.

00:11:00 Deryn Allen-Dyer

Yes.

00:11:00 Nicole Julier-Goodwin

Rather than initial final.

00:11:05 Deryn Allen-Dyer

Skeleton.

00:11:07 Deryn Allen-Dyer

body.

00:11:08 Deryn Allen-Dyer

So like this is like basic what you're gonna expect detail like that.

00:11:14 Deryn Allen-Dyer

It's like that these have been made, yeah?

00:11:18 Deryn Allen-Dyer

Do you know how originally he had like the slabs?

00:11:20 Nicole Julier-Goodwin

Yeah.

00:11:21 Deryn Allen-Dyer

And they were just they were just slabs.

00:11:22 Deryn Allen-Dyer

That I would be completely fine if my if my set designer was to come up to me and was like, here's some slabs that I made.

00:11:31 Deryn Allen-Dyer

Pop them wherever you want.

00:11:32 Deryn Allen-Dyer

I'll take a photo, plop it into CAD.

00:11:35 Deryn Allen-Dyer

Yes.

00:11:36 Deryn Allen-Dyer

And if it's

00:11:37 Deryn Allen-Dyer

Even more basic than that, it's not even like the detail of the windows.

00:11:40 Deryn Allen-Dyer

It's just like, draw a window on it.

00:11:43 Deryn Allen-Dyer

Don't even have to cut to that.

00:11:45 Deryn Allen-Dyer

Just a block, basic outline of where everything's going.

00:11:48 Deryn Allen-Dyer

Okay, I can imagine what it's going to look like.

00:11:50 Deryn Allen-Dyer

And then it's like, okay, I'll take photos.

00:11:54 Deryn Allen-Dyer

And then you create it into this.

00:11:56 Deryn Allen-Dyer

And then you can add the detail, add the texture, add what you want to do.

00:11:59 Deryn Allen-Dyer

It works.

00:12:02 Nicole Julier-Goodwin

Cool.

00:12:03 Nicole Julier-Goodwin

Awesome.

00:12:04 Nicole Julier-Goodwin

Thank you.

00:12:05 Deryn Allen-Dyer

No worries.

00:12:06 Nicole Julier-Goodwin

Are you happy like that?

00:12:07 Deryn Allen-Dyer

I am very happy.

00:12:08 Nicole Julier-Goodwin

I'm glad about that.

00:12:10 Deryn Allen-Dyer

I also think I do.

A4 Transcript with Dominic Humpheys

Participant name: Dominic Humpheys

Role: Amateur 3D Printer

Date: 22/03/2026

Method: In person Interview

00:00:00 Nicole Julier-Goodwin

Sorry, we're going now.

00:00:02 Nicole Julier-Goodwin

So how did you first get into 3D printing and what hooked you on it?

00:00:08 Dominic Humpheys

God, it was, so I remember it was so long ago now, probably about six or seven years ago, I want to say.

00:00:20 Dominic Humpheys

My dad just picked it up as a hobby and he got a printer.

00:00:25 Dominic Humpheys

He made a few things, you know, here and there, almost like just toys and little projects for himself.

00:00:31 Dominic Humpheys

and since then I kind of liked the idea of it because I did a GCSE in design and technology.

00:00:38 Dominic Humpheys

So then I saw that hobby and I thought, all right, I can apply this to things in my GCSEs that I'm actually interested in and passionate about.

00:00:45 Dominic Humpheys

So yeah, pretty much since, I want to say 2018 I've had a printer.

00:00:56 Dominic Humpheys

Sounds about right.

00:00:58 Dominic Humpheys

Yeah, that's the best day I can give you.

00:01:00 Nicole Julier-Goodwin

Yeah.

00:01:03 Nicole Julier-Goodwin

Let's see.

00:01:05 Nicole Julier-Goodwin

What was the first printer you ever used?

00:01:08 Dominic Humpheys

The first printer I ever used.

00:01:10 Nicole Julier-Goodwin

How was it?

00:01:12 Dominic Humpheys

So that was the Ender 3 Pro.

00:01:14 Nicole Julier-Goodwin

Is that the one that I've got the details of?

00:01:18 Dominic Humpheys

Yes, the one we used for your project.

00:01:21 Dominic Humpheys

That was the first printer I ever used.

00:01:24 Dominic Humpheys

And then I had the CR6SE after that.

00:01:28 Dominic Humpheys
But the Ender 3 Pro was great.

00:01:33 Dominic Humpheys
It's really simple to use, which is nice.

00:01:36 Dominic Humpheys
There's no, you know, fancy auto-leveling features.

00:01:39 Dominic Humpheys
You have to do most of it by hand.

00:01:43 Dominic Humpheys
Yeah, and the first print I had, God, what was it?

00:01:47 Dominic Humpheys
I think I printed a little tech deck board for my brother.

00:01:54 Dominic Humpheys
And that printed just fine, you know.

00:01:57 Dominic Humpheys
And then I printed things like Nintendo DS styluses because I'd broken mine.

00:02:02 Dominic Humpheys
Little figurines for my sisters to paint.

00:02:04 Dominic Humpheys
Fidget toys for my friends.

00:02:07 Dominic Humpheys
Yeah, and you know, I almost never had a problem with that printer.

00:02:13 Dominic Humpheys
Yeah, it's the best.

00:02:16 Dominic Humpheys
One of anyways.

00:02:21 Nicole Julier-Goodwin
How has working with 3D printers changed?

00:02:25 Dominic Humpheys
How's it changed?

00:02:27 Dominic Humpheys
I want to say it's gotten cheaper commercially, at least, for hobbyists.

00:02:34 Dominic Humpheys
Yeah, if we take the Ender 3 Pro that I've got, for example, when that released, I think it
retailed at just over 200 quid.

00:02:43 Dominic Humpheys
And now you can probably pick one up second hand, at least for half that price.

00:02:49 Dominic Humpheys
And they're definitely more available and popular now.

00:02:52 Dominic Humpheys
I mean, there's bamboo lab, there's Ender.

00:02:56 Dominic Humpheys
There's Presser, they have their own line of printers.

00:03:01 Dominic Humpheys
All of different models and prices.

00:03:05 Dominic Humpheys
So yeah, I think it's definitely gotten a bit more commercially available and cheaper.

00:03:11 Dominic Humpheys
Yeah.

00:03:12 Dominic Humpheys

How's it changed?

00:03:13 Dominic Humpheys

Has it changed anything else?

00:03:20 Dominic Humpheys

Yeah, I mean, there's lots of different media you can print on now as well.

00:03:22 Dominic Humpheys

You don't just have FDM printing.

00:03:24 Dominic Humpheys

You've got your

00:03:26 Dominic Humpheys

SLS, which uses lasers on powder, I believe.

00:03:30 Dominic Humpheys

And you've got your resin printers.

00:03:32 Dominic Humpheys

And before those were like high-end things that you wouldn't really get as a hobbyist.

00:03:37 Dominic Humpheys

But now they're pretty calm, especially resin printing.

00:03:40 Dominic Humpheys

You see that all the time now.

00:03:43 Dominic Humpheys

Yeah, that's about it, to be honest.

00:03:45 Dominic Humpheys

At least, you know, from a hobbyist perspective.

00:03:47 Nicole Julier-Goodwin

Yeah.

00:03:49 Nicole Julier-Goodwin

That's fun.

00:03:51 Nicole Julier-Goodwin

Let's see.

00:03:51 Nicole Julier-Goodwin

I know your current setup.

00:03:55 Nicole Julier-Goodwin

Which slicer settings do you find yourself tweaking the most?

00:04:00 Dominic Humpheys

Which do I tweak the most?

00:04:01 Dominic Humpheys

Okay.

00:04:03 Dominic Humpheys

I'm going to say probably infill, my infill settings, just because every print I want to have different strengths.

00:04:18 Dominic Humpheys

So, you know, if I was printing something large, I'd make a lower infill setting so it's still got the strength to it.

00:04:25 Dominic Humpheys

but it also prints in a decent amount of time.

00:04:28 Dominic Humpheys

If I was printing something small like a crochet hook or a DS stylus, it doesn't really matter what I set it to because it's going to end up being mostly solid anyways because of the wall count.

00:04:38 Dominic Humpheys

So yeah, I tend to just turn that up to 100 just to make sure it's solid, solid.

00:04:46 Dominic Humpheys

Yeah, that and build plate adhesion settings I tend to change the most.

00:04:52 Dominic Humpheys

So that is an extra couple of lines on the printer that just help it, help the print stick to the bed because it gives it a bit of a larger surface area.

00:05:02 Dominic Humpheys

I tend to say, yeah, I try to tailor that one to each print.

00:05:07 Dominic Humpheys

So longer, thinner prints, I'd give a wider brim to it.

00:05:13 Dominic Humpheys

And then bigger prints, like what we printed for your project.

00:05:15 Dominic Humpheys

I did, I think I did that 3 lines because it's already pretty large surface area on the gold plate.

00:05:20 Nicole Julier-Goodwin

Yeah.

00:05:20 Dominic Humpheys

So you don't need to worry about adhesion as much.

00:05:23 Nicole Julier-Goodwin

Yeah.

00:05:23 Nicole Julier-Goodwin

Makes sense?

00:05:24 Dominic Humpheys

Yeah.

00:05:24 Dominic Humpheys

What we got next?

00:05:29 Nicole Julier-Goodwin

Awesome.

00:05:30 Nicole Julier-Goodwin

What's a common mistake you see beginners make that's easily avoided?

00:05:37 Dominic Humpheys

Oh, okay.

00:05:38 Dominic Humpheys

Common mistake beginners would make.

00:05:44 Dominic Humpheys

I think definitely a mistake I made to start with was not quite understanding how different settings worked within the printer.

00:05:56 Dominic Humpheys

So I guess a common problem something new might have is just familiarity with their setup.

00:06:03 Dominic Humpheys

So when I started printing, because I had a manual bed level, obviously that I messed up with quite a lot.

00:06:12 Dominic Humpheys

and it resulted in a lot of failed prints.

00:06:16 Dominic Humpheys

But in all honesty, a lot of the new printers, they pretty much do it all for you.

00:06:21 Dominic Humpheys

So there isn't really like a very common mistake.

00:06:29 Dominic Humpheys

Yeah, I say there is definitely things to be aware of, like printing temperatures for whatever kind of plastic you're using, because

00:06:39 Dominic Humpheys

like the one that you used is a range of 215 to 230.

00:06:43 Dominic Humpheys

The ones that I used to use had a range of 200 degrees C to 210 degrees C.

00:06:49 Dominic Humpheys

And if you get that temperature wrong, that can cause you some issues where it like just becomes too liquidy and it pours out or it doesn't melt enough and give you a nice quality print.

00:07:04 Dominic Humpheys

Be honest, there's so many ways you can mess up the print.

00:07:06 Dominic Humpheys

I could go on for hours.

00:07:09 Dominic Humpheys

So.

00:07:09 Nicole Julier-Goodwin

Fair enough.

00:07:14 Nicole Julier-Goodwin

How do you approach troubleshooting a failed print?

00:07:19 Dominic Humpheys

Troubleshooting a failed print?

00:07:21 Dominic Humpheys

That's a good question.

00:07:23 Dominic Humpheys

You kind of have to look at the print visually first, like the actual object that you've printed.

00:07:30 Dominic Humpheys

If

00:07:33 Dominic Humpheys

Let's say I've got a failed print and there's lots of little gaps in it.

00:07:37 Dominic Humpheys

So I've printed like a vertical wall, it's got lots of gaps and it's failed and like knocked over halfway through or something.

00:07:43 Dominic Humpheys

You know, that might tell me that it's not got enough plastic coming out of the extruder.

00:07:50 Dominic Humpheys

Or if the bottom of the build is warped, upwards usually is what it is, that would tell me that the print was either too long

00:08:02 Dominic Humpheys

or the bed plate, the build plate wasn't hot enough.

00:08:06 Dominic Humpheys

Because as the plastic cools, it will need to, well, it will take a shape and it will stick less and less the cooler it gets.

00:08:18 Dominic Humpheys

Yeah, I'd have to have like a specific example to show you like your print that failed.

00:08:23 Nicole Julier-Goodwin

Yeah.

00:08:25 Dominic Humpheys

As a specific example then.

00:08:27 Dominic Humpheys

I'm not too sure what happened or
00:08:30 Dominic Humpheys
why what happened happened, but I know that for whatever reason, the nozzle didn't travel
far enough up to continue printing properly.
00:08:40 Dominic Humpheys
And so the hot end went through what had already been printed.
00:08:45 Dominic Humpheys
And that's why we had those lines and those, do you remember the, like almost tag ends that
came diagonally.
00:08:52 Dominic Humpheys
So for whatever reason, it could have been an issue with the slicer or it could have been
00:08:58 Dominic Humpheys
So there's a switch for the height sensor.
00:09:01 Dominic Humpheys
And when the switch is activated or pushed in, that's when the printer knows it's at zero.
00:09:06 Dominic Humpheys
Something must have gone wrong with the calculations there.
00:09:08 Dominic Humpheys
And cause it obviously to just come back down.
00:09:15 Dominic Humpheys
It could have even been the motor for the Z-axis.
00:09:21 Dominic Humpheys
So yeah, a print like that, you kind of just have to try again and see what happens and just
hope for the best really.
00:09:29 Nicole Julier-Goodwin
Awesome.
00:09:35 Nicole Julier-Goodwin
How do you decide whether something should be printed or made a different way?
00:09:40 Dominic Humpheys
That's a good question.
00:09:45 Dominic Humpheys
How do I decide whether something should be made a different way or if it should or should
not be printed?
00:09:50 Dominic Humpheys
Okay, first indicator for either not printing or changing how I print.
00:09:57 Dominic Humpheys
is how long it's going to take.
00:10:00 Dominic Humpheys
Because generally speaking, the longer it takes, obviously I've got to keep an eye on it and
the more plastic it's going to use.
00:10:10 Dominic Humpheys
And how long it takes, can be decided by a bunch of different things, size of the print or if it's
got overhangs really high in the model.
00:10:19 Dominic Humpheys
Obviously we changed a couple of yours, didn't we?
00:10:20 Nicole Julier-Goodwin
Yeah.
00:10:21 Dominic Humpheys
And cut those up.
00:10:23 Dominic Humpheys

So again, to have a specific example,

00:10:26 Dominic Humpheys

The ones of yours that I changed, I changed because, first of all, they're going to take, I think, one almost, what, a day and 12 hours until I sliced it up into smaller pieces.

00:10:37 Nicole Julier-Goodwin

It was going to be insane.

00:10:38 Dominic Humpheys

It was going to be huge.

00:10:40 Dominic Humpheys

You would have had to have had so many support structures because there were overhangs, which completely fine, you know, certain models do just have to have overhangs.

00:10:51 Dominic Humpheys

But that's why I know, you know, I needed to change it.

00:10:56 Dominic Humpheys

and the size of the model itself, regardless of time and support structures, if the model is too big for the plate, I will not print it or change it.

00:11:10 Dominic Humpheys

Because as you get used to a printer, you kind of know, okay, yes, it's got a 20 centimeter by 20 centimeter build plate, but you know at what radius the printer works best, if that makes sense.

00:11:23 Dominic Humpheys

So that printer

00:11:24 Dominic Humpheys

Yes, it's got a massive build plate, comparatively speaking, but it doesn't like to do, it doesn't like to use the whole build plate, if that makes sense.

00:11:33 Nicole Julier-Goodwin

Yeah.

00:11:34 Dominic Humpheys

Because the corners on a glass plate, they do tend to warp over time.

00:11:39 Dominic Humpheys

And that's, again, just another thing you have to be aware of.

00:11:43 Dominic Humpheys

Can I just go and drink?

00:11:44 Nicole Julier-Goodwin

Yeah, of course.

00:11:44 Nicole Julier-Goodwin

Cool.

00:11:45 Dominic Humpheys

What have we got?

00:11:46 Nicole Julier-Goodwin

What's the next one?

00:11:47 Dominic Humpheys

Or is that, or is this something like...

00:11:49 Dominic Humpheys

a sub-question to that one that you've thought of that you want me to answer, because that was a meaty one, to be honest.

00:11:55 Nicole Julier-Goodwin

I don't think so.

00:11:57 Nicole Julier-Goodwin

OK, no worries.

00:11:58 Nicole Julier-Goodwin

Let's see.

00:11:58 Nicole Julier-Goodwin

Can always text me if you got anything else.

00:12:01 Nicole Julier-Goodwin

Oh, absolutely.

00:12:06 Nicole Julier-Goodwin

What's your design process like from idea to finish print, as in if you think of something?

00:12:13 Dominic Humpheys

OK, yeah.

00:12:17 Dominic Humpheys

Okay, so let's have an idea.

00:12:19 Dominic Humpheys

I want to print like a coat hanger, like a one of these little door hook for some coats.

00:12:32 Dominic Humpheys

First thing I'll do is I'll look online to see if somebody's already made it, because there's no point in me spending, you know, however long on a 3D software if somebody's already done the work for me.

00:12:43 Nicole Julier-Goodwin

Yeah.

00:12:44 Dominic Humpheys

Because a lot of places are free and open source.

00:12:47 Dominic Humpheys

So completely legal to get them and use them for whatever you want.

00:12:51 Dominic Humpheys

Apart from selling, you do need to be careful with that one.

00:12:56 Dominic Humpheys

Yeah, let's say I've found something on Thingiverse as my main one, but it's not quite how I want it.

00:13:04 Dominic Humpheys

I will download it from Thingiverse and I will modify it myself to fit my specific needs.

00:13:11 Dominic Humpheys

Recent example, I 3D printed a crochet hook.

00:13:14 Dominic Humpheys

for Rihanna.

00:13:14 Dominic Humpheys

There were a couple of models online.

00:13:17 Dominic Humpheys

She picked one that she sort of liked and then I had to take that to TinkerCAD and adjust it to specifically the sizes that she needed and I changed a few little elements to make it a bit more comfortable to hold.

00:13:29 Dominic Humpheys

And then obviously if I've gotten a model from either Thingiverse or making changes to a model on Thingiverse, I would slice that up and go through the process in Cura of

00:13:43 Dominic Humpheys

Sorting at the end for all the.

00:13:45 Dominic Humpheys

rim, checking the time requirements, and then turning it into the G-codes.

00:13:50 Dominic Humpheys

If I don't find something on Thingiverse, what I tend to do is draw it first, because that saves me a lot of time.

00:13:58 Dominic Humpheys

CAD software, while it's great, it can be a bit frustrating.

00:14:03 Dominic Humpheys

Yeah, I tend to draw it first and think, right, can I make this without 3D printing first of all?

00:14:08 Dominic Humpheys

Or can I use, you know, a proxy thing?

00:14:10 Dominic Humpheys

But let's say I definitely need to 3D print this object that I've thought up.

00:14:17 Dominic Humpheys

Draw it first, get it over into Tinkercad, because that's just a free software that I quite like, and Blender is a nightmare for 3D printing.

00:14:26 Dominic Humpheys

And I'll do a quick design of that, and then sort of just take it from there.

00:14:34 Dominic Humpheys

You know, if I need to change elements, I will.

00:14:37 Dominic Humpheys

I try not to prototype too much, just because I'm conscious of

00:14:43 Dominic Humpheys

At the end of the day, I'm using plastic and I don't have an effective way to recycle that yet.

00:14:50 Dominic Humpheys

A lot of people do make devices that recycle waste 3D prints.

00:14:54 Dominic Humpheys

I just don't have the time to sit and make them and it takes, it's a headache.

00:15:02 Nicole Julier-Goodwin

And the water bottle one.

00:15:03 Dominic Humpheys

And the water bottle one, that's an interesting one.

00:15:07 Dominic Humpheys

Yeah.

00:15:08 Dominic Humpheys

So I try and avoid

00:15:10 Dominic Humpheys

physically prototyping, I will digitally prototype if I have to.

00:15:14 Dominic Humpheys

I think it's probably helpful because I'm probably a little bit autistic, so I can, know how it would work if it were printed properly.

00:15:23 Dominic Humpheys

But don't get me wrong, you know, I've definitely designed a thing, printed it, and then it's come out and, oh no, it's not thick enough and it's come apart.

00:15:33 Dominic Humpheys

I printed a lens cap holder to go on a bag strap for Caitlin.

00:15:38 Dominic Humpheys

First one,

00:15:39 Dominic Humpheys

It came out okay, it came out exactly how I expected it, but where I'd cut the holes through the circular object, it had come apart.

00:15:48 Dominic Humpheys

So I needed to thicken it and reprint.

00:15:51 Dominic Humpheys
And the second print is not done yet, actually.

00:15:55 Dominic Humpheys
I haven't put it on.

00:15:56 Dominic Humpheys
But hopefully that's going to be a bit better.

00:15:58 Dominic Humpheys
So, yeah, I kind of just rambled, but I hope that answers it.

00:16:02 Nicole Julier-Goodwin
No, that makes sense.

00:16:03 Dominic Humpheys
Yeah.

00:16:04 Nicole Julier-Goodwin
Yeah.

00:16:04 Dominic Humpheys
I'll try and find that on thingivers first and then

00:16:08 Dominic Humpheys
From Thingiverse, I either change it if I need to or print straight away.

00:16:11 Dominic Humpheys
If I can't find it on Thingiverse or for free somewhere else, I will draw it, design it, print it, and hope for the best.

00:16:19 Nicole Julier-Goodwin
Yeah.

00:16:19 Nicole Julier-Goodwin
Fair enough.

00:16:20 Dominic Humpheys
That'll be a bit more concisely to find them in transcript.

00:16:22 Nicole Julier-Goodwin
Honestly, honestly, no, rambling is helpful because it allows me to be able to like go, oh, okay, cool.

00:16:27 Nicole Julier-Goodwin
Like that's what they're meaning.

00:16:28 Nicole Julier-Goodwin
And then I'm like, and that's more of like the detail.

00:16:31 Nicole Julier-Goodwin
Like it's super helpful.

00:16:32 Nicole Julier-Goodwin
Yeah, good.

00:16:32 Nicole Julier-Goodwin
That's what this is about.

00:16:33 Nicole Julier-Goodwin
Let's see.

00:16:40 Nicole Julier-Goodwin
Um...

00:16:41 Nicole Julier-Goodwin
Yeah, all good, not a problem.

00:16:42 Nicole Julier-Goodwin
Okay, what do we got next?

00:16:43 Nicole Julier-Goodwin
What we have next is...

00:17:03 Nicole Julier-Goodwin

Oh, I hate when it does that.

00:17:05 Nicole Julier-Goodwin

Um...

00:17:06 Nicole Julier-Goodwin

Nope, nope, nope, nope, nope, nope.

00:17:12 Nicole Julier-Goodwin

Um...

00:17:14 Nicole Julier-Goodwin

I changed it to thing and then I was going to take it off and then it started moving them around and I was like, great, thank you.

00:17:19 Nicole Julier-Goodwin

Well, let's see.

00:17:21 Dominic Humpheys

What innovations have made the biggest difference?

00:17:24 Nicole Julier-Goodwin

Yeah, like industry innovations.

00:17:28 Dominic Humpheys

Innovations, I think the most helpful one for me personally, just because I got into this when I was so young, was auto-levelling.

00:17:37 Nicole Julier-Goodwin

Yeah.

00:17:40 Dominic Humpheys

It's auto-levelling isn't perfect.

00:17:43 Dominic Humpheys

And my, the upgrade to the Ender 3 that I got, the CR6SE, it had all leveling.

00:17:53 Dominic Humpheys

But it had a fixed plate.

00:17:58 Dominic Humpheys

So do you know how this Ender 3 that we've got, it's got knobs on the bottom that I twist to either raise or lower the bed.

00:18:09 Dominic Humpheys

The CR6SE didn't have that.

00:18:13 Dominic Humpheys

So it was a completely rigid plate and it's digitally leveled itself, as in it would compensate for dips in the builder plate by lowering or bringing up the Z axis.

00:18:27 Nicole Julier-Goodwin

Okay.

00:18:28 Dominic Humpheys

Which is fine because the dips are usually so minuscule, you know, it's like 0.0 of a millimeter, which was fine.

00:18:37 Dominic Humpheys

But I think I had a lot of problems with that printer just because I was a stickler for quality.

00:18:44 Dominic Humpheys

However, the next step up from the CR6, the CR10, which my dad has, also has the twisty knobs on the bottom.

00:18:57 Dominic Humpheys

So you could physically change the build plate, which was important if, say, you decided you wanted

00:19:07 Dominic Humpheys

a glass bed instead of a magnetic bed, because glass beds are so much thicker.

00:19:12 Dominic Humpheys

So then you could manually adjust certain things.

00:19:15 Dominic Humpheys

And it let you do it on the fly as well.

00:19:17 Dominic Humpheys

You know, you could change it mid-print if there's a tiny adjustment that you needed, which is really helpful.

00:19:23 Dominic Humpheys

So I think, yeah, while auto levelling was the best innovation for me personally, it still came with a few issues that you had to work around.

00:19:35 Dominic Humpheys

In terms of other innovations, I think a touchscreen was nice.

00:19:41 Dominic Humpheys

A lot of the printers have upgraded screens to either LCD or like pixel touchscreens, which is really helpful just because, first of all, they're bigger.

00:19:52 Dominic Humpheys

So you can get access to all these settings without clicking and hearing that noise over and over and over again.

00:19:59 Dominic Humpheys

But as you know, the Ender 3 Pro is just a whizz wheel.

00:20:03 Dominic Humpheys

and a, it's maybe an inch tall by 3 inches wide.

00:20:07 Nicole Julier-Goodwin

Yeah.

00:20:07 Dominic Humpheys

It's a tiny screen, which works.

00:20:10 Dominic Humpheys

it does the job and it definitely is appropriate for a simpler printer.

00:20:16 Dominic Humpheys

But when you start doing more heavy duty stuff or introducing new settings, you definitely need a nicer screen.

00:20:23 Nicole Julier-Goodwin

You know.

00:20:28 Dominic Humpheys

Yeah.

00:20:28 Dominic Humpheys

Does that answer that one for you?

00:20:29 Dominic Humpheys

Yeah.

00:20:30 Dominic Humpheys

Cool.

00:20:32 Nicole Julier-Goodwin

I feel like that one doesn't really pertain to you.

00:20:34 Dominic Humpheys

What is it?

00:20:35 Nicole Julier-Goodwin

Are there any trends that you think are overrated or misunderstood in regards to like 3D printers?

00:20:40 Dominic Humpheys

OVERRATED?

00:20:42 Dominic Humpheys

There was definitely a trend.

00:20:43 Dominic Humpheys

Have you ever heard of a lithophane?

00:20:47 Nicole Julier-Goodwin

I've heard of it, I think.

00:20:48 Dominic Humpheys

It's kind of like, in terms of 3D printing, you would 3D print a vertical structure that had varying thicknesses and it would create a picture.

00:20:58 Dominic Humpheys

And you would turn a light behind that or put it up against a window.

00:21:02 Dominic Humpheys

and you would be able to see a picture.

00:21:04 Nicole Julier-Goodwin

Yeah.

00:21:06 Dominic Humpheys

I feel like that is, that was a little bit overrated.

00:21:08 Dominic Humpheys

You don't tend to see it now.

00:21:11 Dominic Humpheys

But for me personally, that was overrated because we did so much of that when it was a thing.

00:21:16 Dominic Humpheys

And it was just like, okay, I'm kind of bored of this now.

00:21:18 Nicole Julier-Goodwin

Yeah.

00:21:20 Dominic Humpheys

And one layer prints are really frustrating as well.

00:21:26 Dominic Humpheys

So.

00:21:26 Nicole Julier-Goodwin

That seems so pointless.

00:21:28 Dominic Humpheys

Well, it has a purpose.

00:21:31 Dominic Humpheys

Do you know like a paper airplane?

00:21:32 Nicole Julier-Goodwin

Yeah.

00:21:33 Dominic Humpheys

Okay, you can essentially 3D print that if you make a sheet that's thin enough because it's light enough.

00:21:38 Dominic Humpheys

I 3D printed a couple of dragons and they worked okay, but they're a bit overrated because everybody loved them, but they just broke so easily and they were so hard to print to begin with because they used so much build space and such a thin layer.

00:21:55 Dominic Humpheys

Like you need to get that first layer perfect.

00:21:58 Nicole Julier-Goodwin

Yeah.

00:21:58 Dominic Humpheys
Or you might as well not print it.

00:22:03 Nicole Julier-Goodwin
Yeah, that's annoying.

00:22:07 Nicole Julier-Goodwin
What's the worst print failure you've ever had?

00:22:10 Dominic Humpheys
Worst print failure I've ever had?

00:22:19 Dominic Humpheys
Oh God.

00:22:21 Dominic Humpheys
So it was secondary school.

00:22:23 Dominic Humpheys
I had put on a fidget cube.

00:22:26 Nicole Julier-Goodwin
Yeah.

00:22:26 Dominic Humpheys
Sort of like a self.

00:22:27 Dominic Humpheys
It falls in on itself multiple times.

00:22:31 Dominic Humpheys
I was doing this on, I want to say it was the CR6.

00:22:37 Dominic Humpheys
It might have been the end of three to be honest with you, but I'd put it on in the morning before I went.

00:22:43 Nicole Julier-Goodwin
Yeah.

00:22:46 Dominic Humpheys
Which was fine, you know, my dad popped in every now and again to check on it.

00:22:50 Dominic Humpheys
I think, yeah, by the time I'd gotten back, it had maybe half a centimeter of the block actually printed and the rest of it was strings.

00:23:02 Dominic Humpheys
it looked like somebody had just stabbed a can of silly string and thrown it on my build plate.

00:23:07 Dominic Humpheys
And I was absolutely gutted because it was like an 8 hour print.

00:23:10 Dominic Humpheys
I set it off in the morning before I went, it finished before I came back.

00:23:13 Dominic Humpheys
So it was sat there, you know, the printer was all happy, the build plate had come forward, here, look what I printed.

00:23:18 Dominic Humpheys
And it was just a pile of ****.

00:23:22 Dominic Humpheys
So yeah, that one was pretty gutting for me personally.

00:23:26 Dominic Humpheys
I've had a couple of other prints like that, but you know, sometimes it just happens.

00:23:30 Nicole Julier-Goodwin
Yeah.

00:23:32 Dominic Humpheys

You live and you learn, Absolutely.

00:23:36 Nicole Julier-Goodwin

Let's see.

00:23:36 Nicole Julier-Goodwin

Have you ever printed something that surprised you in a good way?

00:23:39 Dominic Humpheys

Something that surprised me in a good way.

00:23:47 Dominic Humpheys

I printed a lot of stuff that was, that's worked really well.

00:23:51 Dominic Humpheys

I know I said it was overrated.

00:23:53 Dominic Humpheys

But those one layer dragons that I printed, I printed a couple of those and everyone thought they were awesome.

00:23:58 Dominic Humpheys

So like, it deserved the hype.

00:24:00 Dominic Humpheys

But by the end of it, was kind of like, okay, yeah, this is frustrating now.

00:24:03 Dominic Humpheys

I think another thing that surprised me was the Nintendo DS stylus that I printed.

00:24:11 Nicole Julier-Goodwin

Oh, yeah.

00:24:11 Dominic Humpheys

Because I've still got the damn thing.

00:24:13 Nicole Julier-Goodwin

It's stunning.

00:24:14 Dominic Humpheys

I printed this.

00:24:15 Nicole Julier-Goodwin

Oh, look at that.

00:24:19 Dominic Humpheys

Like 5 years ago on that printer.

00:24:21 Dominic Humpheys

Oh, yeah.

00:24:23 Dominic Humpheys

because I accidentally snapped the last one.

00:24:27 Dominic Humpheys

And I don't know, I just, I'm just proud of it because of its simplicity and the fact that, it was one of the first things I printed and it still works perfectly.

00:24:38 Dominic Humpheys

So yeah, that one's definitely on the top 10 list, even though it's just a stick.

00:24:44 Nicole Julier-Goodwin

No, but it's functional.

00:24:45 Nicole Julier-Goodwin

It works.

Pause in recording for off topic interruption

00:25:08 Nicole Julier-Goodwin

Is there anything you wanted to say?

00:25:09 Dominic Humpheys
Anything I wanted to say?

00:25:10 Nicole Julier-Goodwin
Just in general law.

00:25:15 Dominic Humpheys
Off the top of my head, no.

00:25:18 Dominic Humpheys
But if there's anything left that you need to know for your IP, someone specifically that you're working on, I'm more than happy to answer any questions about that.

00:25:28 Dominic Humpheys
But if not, I wouldn't know what to say, if that makes sense.

00:25:30 Nicole Julier-Goodwin
No, that's fair.

00:25:34 Dominic Humpheys
Obviously, I know a little bit about what your IP is about as 3D printing versus hand modeling, right?

00:25:38 Dominic Humpheys
You know, just everything around that.

00:25:40 Nicole Julier-Goodwin
Yeah.

00:25:42 Dominic Humpheys
I'd say you're probably better off hand modeling.

00:25:45 Dominic Humpheys
Given what we've experienced.

00:25:48 Nicole Julier-Goodwin
Yes, 100%.

00:25:48 Dominic Humpheys
Working together, you're easier hand modelling.

00:25:52 Nicole Julier-Goodwin
Time waste, 100%.

00:25:53 Dominic Humpheys
Yeah, because waste is more commercially recyclable.

00:25:56 Dominic Humpheys
You can do it a lot quicker if you're skilled.

00:25:58 Dominic Humpheys
And obviously you are.

00:26:02 Dominic Humpheys
Yeah.

00:26:03 Dominic Humpheys
And obviously you don't have to wait for shipping.

00:26:06 Dominic Humpheys
You don't have parts like PLA or waiting to have a printer ready, especially when university politics around it change so much.

00:26:14 Dominic Humpheys
But I would also say something better than hand modeling would be doing digital designs like you did.

00:26:23 Nicole Julier-Goodwin
Yes.

00:26:24 Dominic Humpheys

So I'd say like in order of superiority would probably be 3D designs, physical models that you make with craft paper or whatever it is you do.

00:26:33 Dominic Humpheys

Styrofoam I think is another one that you use.

00:26:36 Dominic Humpheys

And then 3D printing.

00:26:37 Dominic Humpheys

3D printing is like your last, you know, it's the end of the line sort of thing.

00:26:41 Dominic Humpheys

Avoid it at all costs.

00:26:43 Dominic Humpheys

Just because it's just a pain in the back.

00:26:45 Nicole Julier-Goodwin

Yeah.

00:26:46 Dominic Humpheys

I love, I love 3 to pick with a passion and the rocket needs to reflect that.

00:26:51 Dominic Humpheys

But yeah, it's a pain in the bum and it definitely has its own very niche place.

00:27:01 Dominic Humpheys

Yeah, I think that's everything for me.

00:27:03 Dominic Humpheys

Again, if you've got any more questions, text me.

00:27:06 Nicole Julier-Goodwin

Absolutely.

00:27:07 Dominic Humpheys

And I can record it for you.

00:27:08 Dominic Humpheys

I can just visual it.

00:27:11 Dominic Humpheys

I can talk through it, send you like a WhatsApp audio recording, you can just tack it onto the end of that file if you wanted.

00:27:18 Nicole Julier-Goodwin

Even messages will be fine, I think.

00:27:19 Dominic Humpheys

Yeah, whatever, whatever works best for you.

00:27:23 Dominic Humpheys

But yeah, that's it for me pretty much.

00:27:26 Nicole Julier-Goodwin

Fantastic.

00:27:26 Nicole Julier-Goodwin

Thank you very much.

00:27:28 Dominic Humpheys

Of course.

B1 - Questionnaire Response - Joe Collins

Question	Response
Industry & Role	Freelance Theatre Stage Manager
Experience	2 years

How often do you work with set models?	Fairly consistently
Interaction level	They're essential to understanding the desired outcome of a show
Information looked for	How various staging elements interact with each other and how that might impact props, actors, etc.
Experience with digital models	I've never had a digital set model
Thoughts on digital models	I've never used them before
Preference	I prefer physical models because they're tactile and it's useful to be able to hold specific elements and ask questions about things you might not have thought of compared to a digital version.
Would quicker access help?	Absolutely. One of the biggest problems I have is access to the model... we can't have it in rehearsals as much as we'd like.
Additional comments	—

B2 – Questionnaire Response – KD

Question	Response
Industry & Role	Theatre – Lighting designer, programmer and electrician; Live events – rental shop tech and electrician/general hand
Experience	3 years
How often do you work with set models?	almost never
Interaction level	—
Information looked for	—
Experience with digital models	—
Thoughts on digital models	—
Preference	yes
Would quicker access help?	—
Additional comments	@kd.lx

B2 – Questionnaire Response – Aza

Question	Response
Industry & Role	Production Manager
Experience	8 Years
How often do you work with set models?	I work with stage plots and flat designs more than 3d models. But I still use 3d models for rigging.
Interaction level	They inform the stage process for the touring shows coming in. I follow them most of the time. We don't build anything in our house.
Information looked for	Sizings, if lagging is required.
Experience with digital models	I have, it sucks when it's not specific to the venue.
How often	Handful of times.

Thoughts	PDF draft models.
Preference	Nope
Additional comments	artsblooming.org

B2 – Questionnaire Response – Dominic Shah

Question	Response
Industry & Role	Film and TV – Art department assistant/Jr Draftsman
Experience	1–5 Years
How often do you work with set models?	Fairly often with 3d models... Less with physical models... sometimes no time or money for them...
Interaction level	Very closely, they are always being adjusted and adapted, for cosmetic and logistic purposes.
Information looked for	Clear accurate dimensions... clear layers or components... accurate dimensions.
Experience with digital models	Since graduating both film tv and theatre work I've done have all been digital models... havnt seen a physical model used yet.
How often	Very often.
Preference	Digital definitely, as you can create construction drawings from them.
Would quicker access help?	Yes definitely, it holds the visuals and the infomation
Description of self	I'm a designer who used sketchup and Autocad.
Physical/digital	Digital Models
Scale	Would be 1:25
When start model	Asap
Digital modelling	Yes
3D printing	No
Reason for not using	N/a
Would consider in future	—
Software used	Sketchup and Autocad, just what I've learnt and it's cheaper than Rhino
Time spent modelling	All day
Advantages/disadvantages	Less pretty and 'artistic'
Additional comments	—

C1 – Time Efficiency Tables

Initial Model

<i>TASK</i>	Hand-Made Model (Hour: Minutes: Seconds)	Digital Model (Hour: Minutes: Seconds)
<i>Nesting</i>	00:18:08	N/A
<i>One Wall Segment</i>	00:4:50	00:2:37
<i>One Door wall Segment</i>	00:3:09	00:1:59
<i>One Deck Segment</i>	00:5:13	00:1:12
<i>Base Board</i>	00:21:48	00:1:23

White Card Model

<i>TASK</i>	Hand-Made Model (Hour: Minutes: Seconds)	Digital Model (Hour: Minutes: Seconds)	3D Model (Hour: Minutes: Seconds)
<i>Nesting</i>	00:34:21	N/A	00:27:49
<i>One Wall Segment</i>	02:08:38	00:51:18	21:11:00
<i>One Door wall Segment</i>	02:34:03	01:00:53	22:55:00
<i>Decking</i>	03:14:57	00:56:43	10:12:00 (single 1mx2m steel decking segment)
<i>Base Board</i>	(same as before)	(same as before)	N/A

C2 – Material Wastage Tables

Initial Model

TASK	Hand-Made Model (Grams)	Digital Model (Grams)
<i>Offcuts</i>	37g	N/A
<i>Failed Components</i>	6g	N/A
<i>Adhesive waste</i>	N/A	N/A
<i>PLA failed prints</i>	N/A	N/A
<i>Support Structures</i>	N/A	N/A

White Card Model

TASK	Hand-Made Model (Grams)	Digital Model (Grams)	3D Model (Grams)
<i>Offcuts</i>	132g	N/A	N/A
<i>Failed Components</i>	24g	N/A	N/A
<i>Adhesive Waste</i>	1g	N/A	N/A
<i>PLA failed prints</i>	N/A	N/A	76g
<i>Support Structures</i>	N/A	N/A	11g

C3 – Financial Efficiency Tables

Physical Model

<i>Item</i>	Bought	Amount used	Total cost for this model	Shipping	Total overall cost
<i>White Mountboard A2</i>	10 at £1.99 each	6	£11.94	£0.00	£19.90
<i>White Foamboard A2</i>	4 for £19.00	4	£19.00	£0.00	£19.00
<i>Swann Morton Blades</i>	100 for £25.89	14	£3.62	£0.00	£25.89
<i>Tacky Glue</i>	1 for 6.99	0.25	£1.75	£3.50	£10.49
<i>Balsa Wood Sheets</i>	5 for £3.25	£0.00	£0.00	£0.00	£16.25
<i>Sculpey Modelling Clay</i>	1 for £11.99	0	0	0	£11.99
<i>AutoCAD</i>	0	0	0	0	£1890 /year
<i>Total Costs</i>			£36.31	£3.50	£103.52
<i>With Autodesk</i>					£1993.50

Digital & 3D printing

<i>Item</i>	Digital Model (Grams)	3D Model (Grams)
<i>Energy</i>	80W for 176 minutes = £0.06	270W for 3285 minutes = £4.09
<i>AutoCAD</i>	£1890 /year	N/A
<i>Fusion for Design</i>	£1974 /year	£1974 /year
<i>Prusa Slicer</i>	£0.00	£0.00
<i>3D Printer (Creality Ender 3)</i>	N/A	£135
<i>Filament</i>	N/A	£15.99
<i>Total Cost</i>	£3864.06	£2129.08

D1 – Hand-Made Model Module Section Wall



D2 – Hand-Made Model Module Section Door



D3 – Hand-Made Model Module Section Decking

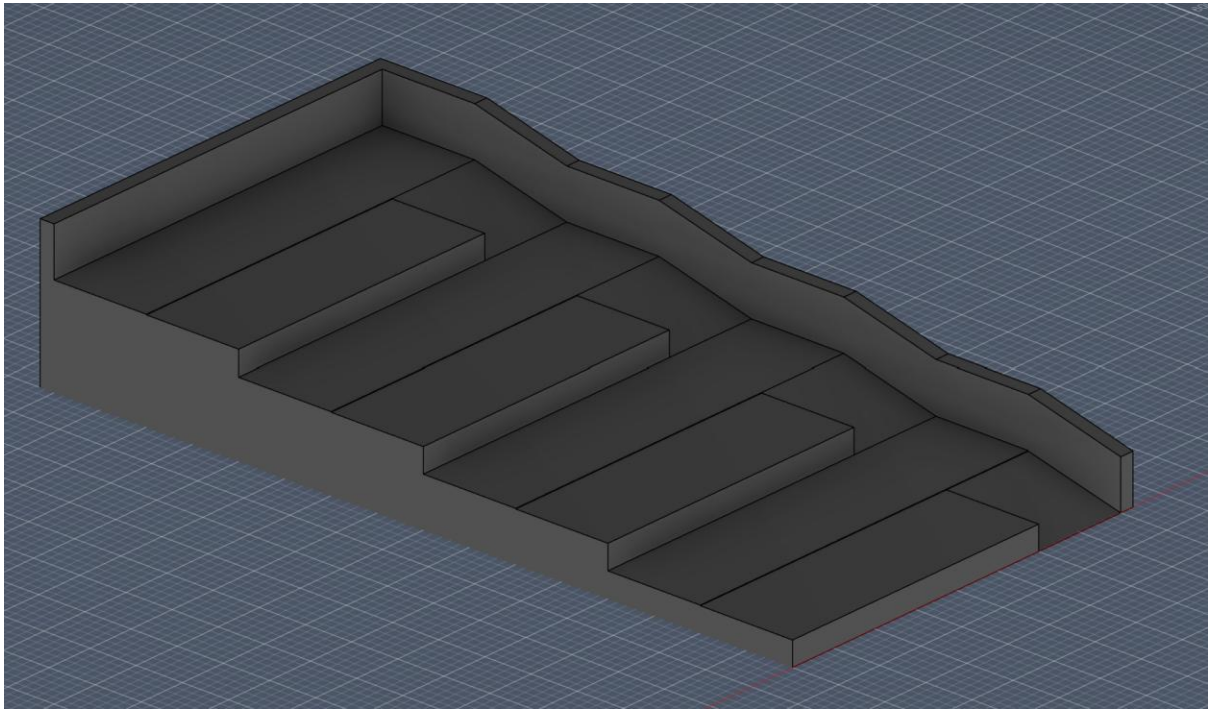
D4 – Digital Model Module Section wall



D5 – Digital Model Module Section door



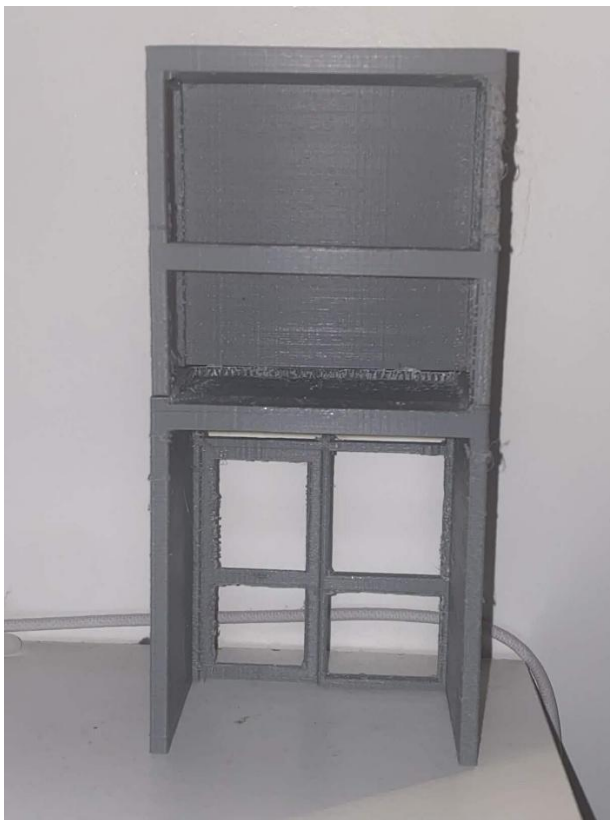
D6 – Digital Model Module Section Decking



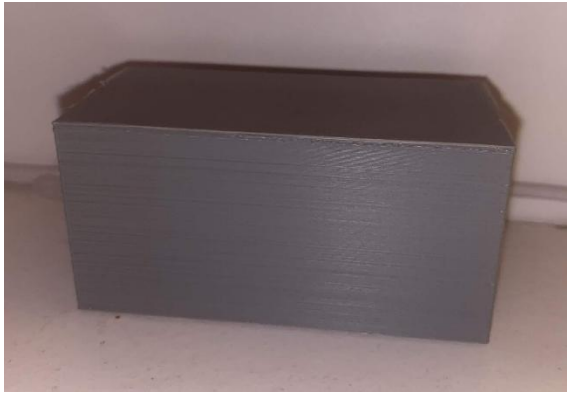
D7 – 3D Printed Model Module Section wall



D8 – 3D Printed Model Module Section Door



D9 – 3D Printed Model Module Section Decking



E1 – AutoCAD Nesting Layout

