

## Special Issue: Issues in Teaching Theatre Design

Carly Holzwarth, Guest Editor  
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## Patterns for Success: Training the Next Generation of Costume Technicians in Digital Garment Simulation and Pattern Drafting Software

Alyssa Ridder

Metropolitan State University of Denver, United States of America

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### Abstract

Pattern drafting for costume design is a complicated skill set that requires access to training, years dedicated to learning, and an unsustainable amount of time in the day to accomplish the work. This essay proposes a solution to these barriers with a case study that introduces digital technology into the pattern drafting classroom. The case study consisted of two parts: first, I taught participants how to draft a pattern using traditional methods. Then I taught the same set of participants a similar project using the digital pattern drafting software CLO. The participants were evaluated on the following criteria: ease of access to the learning materials and equipment, proficiency of skills learned, and speed in accomplishing projects.

Traditional pattern drafting is a skill for the privileged. The pattern drafting classroom requires dedicated space and supplies, an in-person mentor, and significant weekly lab time to practice and check the work. In this case study I propose an alternative to the paper, pencil, and ruler method by utilizing a digital garment simulation and pattern drafting software called CLO. To test this alternative, I conducted a workshop that consisted of two parts: traditional patterning methods and digital patterning methods. I evaluated the participants and their work on the following criteria: ease of access to the learning materials and equipment, proficiency of skills learned, and time spent completing the projects. I collected the results of the workshop in the form of anonymous participant surveys, images of the final projects, and my own observation of the process as the instructor.

The workshop consisted of two days. On the first day, I taught five participants a project in a costume studio using traditional tools. On the second day, I taught the same five participants the same project in a computer lab using CLO. The project involved draping a basic female bodice block on a dress form, translating it into a flat pattern, performing a simple dart manipulation technique, and then creating a mockup to check their work. I attempted as much parity as possible between the two days by teaching similar tasks in a similar order with similar degrees of coaching and explanation. At the end of each day the participants were asked to take part in a survey and their projects were documented as photos, scans, exports, and renders. All five participants had previously taken some form of an introduction to costume construction course before this workshop, but had moderate to no experience with traditional pattern drafting and minimal to no experience with digital pattern drafting.

The first question of the case study was accessibility. When asked “How accessible are the tools and equipment you need to practice the skills you learned today beyond this workshop?” the participants on average found the traditional tools to be accessible on a scale of 7.8/10 and the digital tools accessible on a scale of 6.2/10. This data raises the question: what does it mean to be accessible? Some of the participants have access to a full shop with muslin and dress forms while in school, but what about after school? A higher end PC that runs CLO well may cost \$1,000-1,500, but a single dress form in only one size costs on average \$500. In CLO the user has virtually unlimited options for body types and sizes, but multiply a \$500 dress form by at least three sizes and the digital approach becomes not only more accessible but significantly more inclusive. Similarly, although a CLO license currently costs \$50/month (\$25/month for students), the various patterning tools combined could range from \$100-\$500. The license requires renewal, but muslin and butcher paper require restocking. With this in mind, the digital method becomes not only more accessible but has the benefit of being sustainable for the environment.

Another issue of accessibility is access to learning materials. When asked “What learning

materials do you have access to for developing the skills you learned today beyond this workshop?” participants cited the instructor, the internet, and books as a resource for traditional methods, but only cited the instructor and the internet as a resource for digital methods. Although participants perceived they have at least one more type of resource for learning digital skills than learning traditional skills, the survey does not reflect the quality of the materials or the quantity of the materials available, just that they exist in more formats. Speaking from my own experience as the instructor, teaching CLO is more accessible than teaching traditional pattern methods because I can teach it remotely. Teaching traditional patterning remotely is difficult because without physically handling the project there is no way to check the student’s work in order to offer guidance. In contrast, I have been offering private tutoring in patterning in CLO with great success to students with a wide range of skills via Zoom for the past few years. In CLO, both the instructor and the student can see what needs to be done in detail and files can be sent back and forth to check and revise work.

The next criteria I examined through the workshop is proficiency of skills learned. The survey asked participants, “How comfortable were you in traditional draping and pattern drafting methods before today's exercise?” and “How comfortable are you in traditional draping and pattern drafting methods after today's exercise?” The participants responded with an average comfort level of 4.4/10 before the exercise and an average comfort level of 6.8/10 afterwards for an average difference of 2.4. In contrast, the same question for the digital portion resulted in a 1.2/10 average before and 6.8/10 average afterwards for a difference of 5.6. Although the participants expressed significantly more improvement in digital than physical tools, I observed participants struggling with the same principles of pattern drafting in both workspaces. For example, I adjusted one participant who marked the front dart line on their physical dress form past the fullness of the bust point (thus making the dart too long) on day one, and then on day two the same participant made the same mistake while taping out the front dart on the digital form. Another participant who struggled with the concept of truing her patterns on day one had similar issues in truing her work on day two. This experience suggests that although the learning curve of using the digital tools may be easier, learning the principles of patterning still requires careful instruction. The final results of the participants’ work are featured in Figures 1-4.

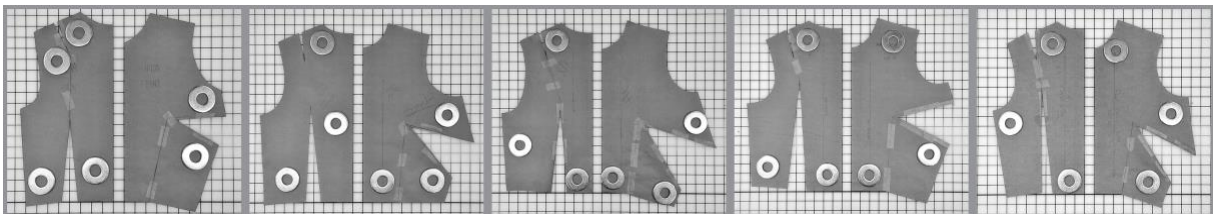


Figure 1. Paper patterns from day one.



*Figure 2.* Digital vector patterns from day two.



*Figure 3.* Mockups from day one.



*Figure 4.* Digital renders of mockups from day two.

An issue related to both accessibility and skill proficiency is time. On day one the participants worked for five hours and on day two they worked for two and a half hours. One of the reasons the digital portion was faster was because the participants took an average of two hours to cut their patterns out of muslin and stitch them together in order to check their work. In CLO, the pattern is stitched together digitally and simulated so they can see the three-dimensional results of their two-dimensional pattern in real time. However, even without sewing the mockup, the traditional draping and patterning process alone took one hour longer than the digital process. The remaining difference in time was for introducing the participants

to CLO's digital interface for a half hour on day two while I took no time introducing the participants to the physical space of the costume studio on day one. With all of this in consideration, the lesson took less than half of the amount of time to teach digitally. As the instructor, I think this is the most significant argument for integrating digital pattern drafting in the classroom. A paperless patterning process conserves our students' most valuable resource: time. The daily work in theatrical pattern drafting has a severely imbalanced labor-to-compensation ratio, rendering it inaccessible as a career path except to those who can afford it. Digital patterning offers a solution to the issues of accessibility, time investment, and labor-to-compensation ratio that currently plague the theatrical costume classroom and the costume industry as a whole.

The final question I asked the participants after they completed both projects was: "Are you more interested in learning more about TRADITIONAL draping and flat patterning or DIGITAL draping and flat patterning?" 100% of the participants responded, "Both." As an educator I affirm this response. While there may come a day when all shops are equipped with sufficient technology and workflows for integrating digital pattern drafting, this may not be for many years, and only if universities begin to integrate it into their programs soon. My goal is to integrate CLO into my own program but in the meantime continue to teach traditional skills so that my students can pave the way to the future while still remaining competitive in the industry that exists now.

### **About the Author**

Alyssa Ridder is a costume designer for theatre and digital media based out of Denver, CO. She received her MFA in costume design from The Pennsylvania State University and proudly serves as the Lecturer of Costume Design & Technology at Metropolitan State University of Denver. Alyssa's passion for design is in reviving older works in dramaturgically exciting ways and is an advocate for ethical design practice. She is a leading industry professional in integrating costume technology with 3D garment simulation for a more sustainable theatrical workflow and leads workshops in CLO across the United States and online. [www.alyssaridder.com](http://www.alyssaridder.com)

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