

BLUE·PRINT

noun: **blueprint**; plural noun: **blueprints**

a design plan or other technical drawing.

verb: **blueprint**; 3rd person present: **blueprints**; past

tense: **blueprinted**;

past participle: **blueprinted**; gerund or present participle:
blueprinting

draw up (a plan or model).

"TAGA is blueprinting the future."

PLANNING OUR FUTURE

As students, we are intentionally mapping out our paths within the Graphic Communications industry. Just as blueprints guide the construction of a final product, our research serves as a foundational plan that helps us better understand industry processes, technologies, and standards. Through this journal, we are building knowledge step by step, using research to inform our decisions and prepare ourselves for future roles in an evolving field.



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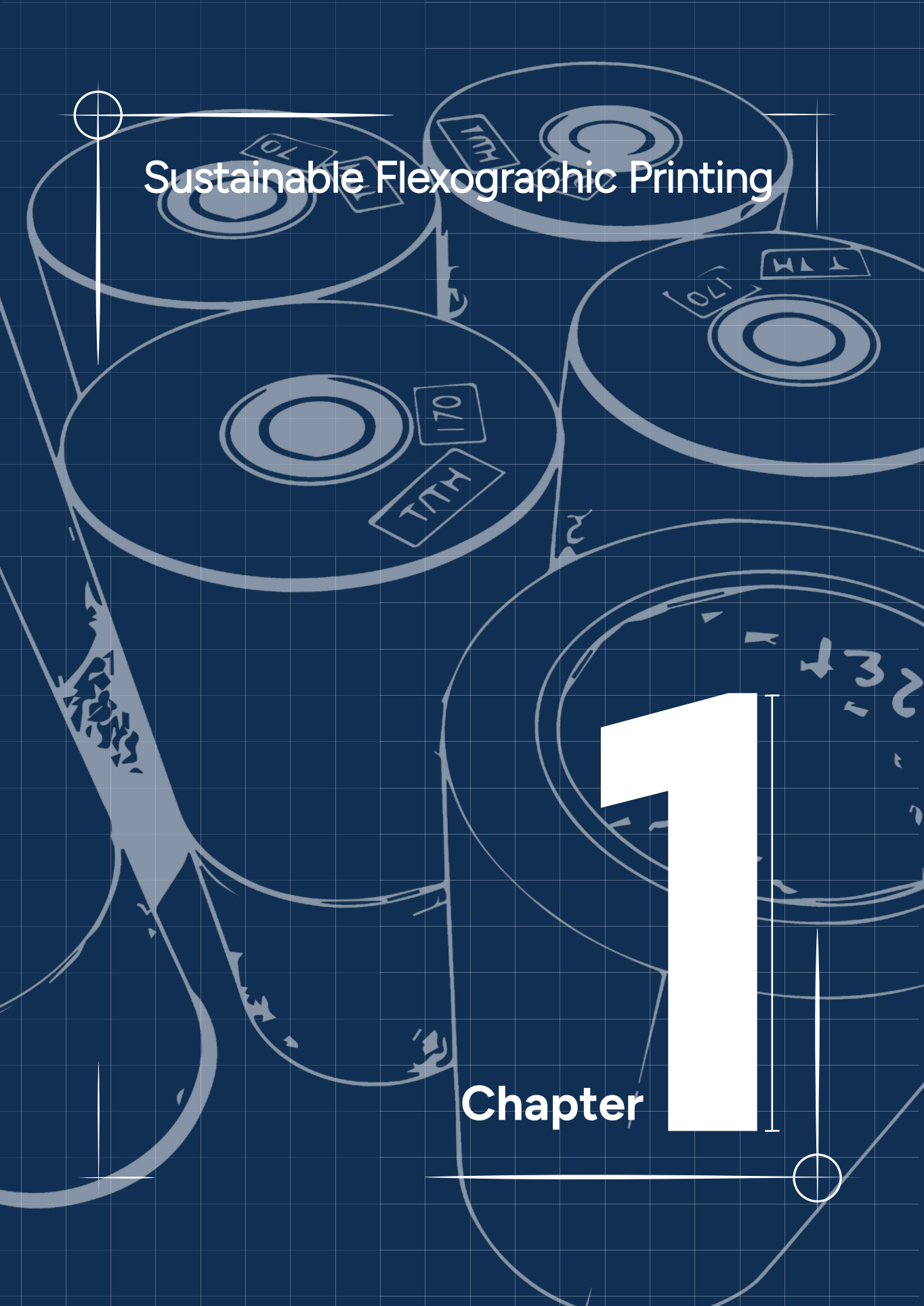
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Sustainable Flexographic Printing

Chapter

1



Sustainable Flexographic Printing: Comparative Study of tesa® Twinlock vs. Single-Use Stickyback

By Madison Montgomery and Julia Shumaker

Abstract

This research compares two common flexographic mounting systems, 3M stickyback tape and the reusable tesa® Twinlock sleeve, to determine which performs better in terms of consistency, cost, and sustainability. Stickyback is widely used but contributes to material waste and inconsistent results during long print runs. Twinlock promises reusability and reduced material waste. Our study includes a literature review, hands-on testing, cost analysis, and sustainability assessment. Findings suggest that Twinlock offers a more environmentally and economically sustainable solution for high-volume pressrooms. Testing showed longer-lasting adhesion with lower standard deviation, and lifecycle analysis demonstrated reduced tape waste. These results support industry trends toward reusable materials in flexographic workflows.

Introduction

In the flexographic printing industry, efficiency, and sustainability are growing increasingly more critical. Plate mounting plays a key role in achieving consistent quality and reproducibility on press. Two commonly used systems are stickyback adhesive tapes and tesa® Twinlock self-adhesive reusable sleeves. This report investigates the differences in performance, consistency, cost, and sustainability between these two mounting solutions, with a focus on providing actionable insights for pressrooms seeking to streamline operations and reduce waste.

With global packaging waste reaching over 300 million tons annually, flexographic printers are under pressure from brands and governments to adopt more sustainable, circular manufacturing systems (UNEP, 2023). Mounting materials, while small in size, contribute significant cumulative waste due to their single-use nature in traditional processes.

Problem Statement

This study aims to evaluate whether the tesa® Twinlock mounting sleeve offers superior performance, longevity, and sustainability compared to traditional stickyback tape. Our hypothesis was that Twinlock would perform more consistently across mounting cycles, require less frequent maintenance, and reduce environmental waste compared to stickyback. This project also sought to identify real-world challenges during repeated plate mounting and quantify long-term costs.

The key question we hoped to answer: Does a reusable mounting system like Twinlock meaningfully outperform generic single-use stickyback in efficiency and sustainability?

Literature Review

Stickyback, also known as double-sided adhesive mounting tape, has been a staple in the flexographic industry for mounting photopolymer printing plates. Offered by companies such as 3M and tesa®, stickyback is praised for its simplicity and reliable adhesion. However, drawbacks include waste generation, seam-related lifting, and the need for constant replacement. According to 3M (2024), their Cushion-Mount tapes offer solid compression resistance and consistent print quality, but require replacement after each job, generating significant waste, downtime and material cost.

In contrast, tesa® Twinlock sleeves are a reusable alternative featuring a built-in adhesive layer that can be reactivated through cleaning with isopropyl alcohol. The outer surface consists of a polyolefin foam layer with a tacky resin topcoat, designed to hold the plate securely while allowing multiple uses before cleaning is required. Through testing, we found that materials other than a photopolymer plate struggled to adhere to the Twinlock, ensuring minimal debris under the plate. Tesa (2023) claims that Twinlock sleeves can be reused for hundreds of cycles, reducing costs and waste. The Twinlock technology was originally developed by Polymount before being acquired and rebranded by tesa in 2017. Since then, tesa has further developed the system under its sustainability initiative, positioning Twinlock as a leading alternative to single-use stickyback tapes (Polymount, n.d.; tesa.com, 2020a).

The environmental advantages are becoming harder to ignore. Twinlock's reusability eliminates the need for rolls of adhesive tape waste and reduces ink and solvent waste associated with frequent tape changes. A 2023 Tesa sustainability report indicated that facilities converting from stickyback to Twinlock saw a 30% reduction in solvent usage per press shift. As highlighted by Windmöller & Hölscher (2023), many global flexographic press manufacturers support reusable sleeve systems like

Twinlock as part of broader efforts to reduce makeready waste and solvent emissions. According to a case study by Tesa (2023), a mid-sized label printer reduced makeready time by 20% and annual tape waste by over 2,204.62lbs after converting to Twinlock.

This efficiency gain aligns directly with the results of our mounting endurance and efficiency testing. On average, tesa® Twinlock sustained approximately 13 cycles before requiring cleaning, with a low standard deviation of ± 1.79 , indicating high consistency across mounts. Stickyback, by comparison, began lifting after approximately 9.4 cycles, with a much larger standard deviation of ± 3.92 , demonstrating inconsistent adhesion and early failure. These results validate industry reports while providing quantifiable support for pressrooms evaluating conversion to Twinlock. With Twinlock, not only does performance hold steady over more mounts, but the reduced need for operator intervention decreases downtime and opportunities for error.

Adopting a sleeve-based system like Twinlock also has long-term financial benefits. While the initial sleeve cost is higher, the reduction in consumable tape, disposal costs, and downtime delivers a return on investment within a few months of regular press operation. As printers face increasing pressure to meet sustainability goals, reduce costs, and improve turnaround times, these benefits make Twinlock a future-forward choice that supports both production and environmental performance.

Facilities looking to switch their systems to Twinlock can send their used sleeves to Tesa, where they grind up the sleeves and use the waste to create new Twinlock. While this doesn't save on expenses, it is a great option to reuse your old sleeves when making the switch. This option increases the sustainability aspect of the Twinlock, making it an environmentally active option.

Hypothesis

We hypothesized that Twinlock would outperform stickyback in both endurance and consistency. Our goal was to quantify how many mounts each system could sustain before failure, and how often cleaning or replacement was required. Metrics included the number of usable mounts, consistency across mounts (standard deviation), and material cost per 1,000 mounts. Secondary goals included estimating environmental waste and labor savings.

Responsibilities

- **Madison:** Designed the test target and made plates; co-led literature research and writing; led Day 1 testing and cost analysis.
- **Julia:** Developed testing procedures; co-led literature research and writing; led Day 2 testing and sustainability analysis.
- **Both:** Conducted research, testing, analysis, presentation design, and writing collaboratively.

Methods & Materials

The testing evaluated adhesion endurance and cleaning/replacement needs. We used two mounting systems:

- 3M stickyback tape
- tesa® Twinlock reusable sleeve

Plates were mounted and demounted 100 times. We performed cleaning with 70% isopropyl alcohol every 40 mounts (Twinlock) or upon plate lift (stickyback). A 15-second dwell was applied before each removal on Day 2. Testing was done in a simulated lab setting using flexo mounting procedures. Adhesion failure was recorded visually.

Resources

- **Substrate:** Standard photopolymer plate material
- **Mounting base:** Plate sleeve compatible with stickyback and Twinlock
- **Adhesive mounting system:** 3M stickyback tape; tesa Twinlock sleeve
- **Cleaning materials:** Lint-free cloths, 70% isopropyl alcohol
- **Measurement:** Manual observations of plate lift, cycles tracked per system
- **Location:** Advanced Lab, Clemson University, Godfrey Hall

Timeline

TASK NAME	START DATE	END DATE	# WORK DAYS	TEAM MEMBER(S) RESPONSIBLE
Form Team	7/21		1	Madison & Julia
Pick Topic	7/21		1	Madison & Julia
Formulate Research Hypothesis	7/22		1	Madison & Julia
Begin Research (each find 5 sources to	7/22	7/24	3	Madison & Julia
Develop Problem Statement	7/22	7/23	2	Madison & Julia
Write Literary Review	7/22	7/24	3	Madison & Julia
Create Test Target	7/22		1	Madison
Make plates	7/23	7/24	2	Madison
Develop Procedures for the Test	7/24		1	Julia
Testing Day 1	7/28		1	Madison & Julia
Testing Day 2	7/29		1	Madison & Julia
Write Project Report and Summary	7/29	8/1	4	Madison & Julia
Turn in the Written Report	8/5		1	Julia
Final Presentation	8/5		1	Madison & Julia

On Monday, July 21st, Madison and I formed a group and selected our topic. We decided to research and test the performance of Tesa Twinlock sleeves vs. traditional flexographic stickyback.

Our research phase began on Tuesday, July 22nd, with the development of our research hypothesis. We then gathered information on the topic, with each of us finding 5 relevant sources by July 24th. Once we had a basis of research, we identified a clear problem statement on July 23rd.

During our research stage, we began writing our literature review. This is something we both contributed to throughout the week and completed on July 24th. The next step of our plan was to prepare for the experiment itself. Madison created a test target file, which we then used to make flexographic plates. These tasks occurred over July 22nd - 24th.

Once our flexo plates were made, we gathered the rest of our materials and developed our procedures in preparation for test days. Procedures were defined by July 24th, because Test Days 1 and 2 were July 28th and July 29th (Monday and Tuesday) of the following week.

Once we completed both of the tests, we reviewed the results to write the rest of the project report and summary. We wrote the report between July 29th and August 1st. We then submitted the report and completed our in-class presentation on August 5th.

Testing Procedures

To compare tesa® Twinlock sleeves and traditional stickyback tape, we performed a mounting endurance and efficiency test. In this experiment, plates were mounted and removed repeatedly under consistent conditions to simulate typical pressroom use. Each mounting cycle included rolling the plate onto the Twinlock or tape, then peeling it off. On day one, mounts were performed back-to-back with minimal downtime. A cycle was counted only when the plate would no longer adhere. On testing day two, we executed a 15-second rest after mounting before peeling off. A cycle was counted when the plate would be considered no longer usable in a pressroom setting.

Experimental Design

On day one, we mounted and remounted our test plate to each mounting system for 40 cycles. After reaching 40, we cleaned the plate for 30 seconds while it remained mounted on the sleeve or stickyback, then continued the mount/remount process until the plate could no longer adhere to the system. We found that the stickyback would no longer be usable in pressroom terms once we mounted and remounted 50 cycles and one cleaning. By the time we reached 100 cycles and two cleaning sessions, the plate no longer adhered to the sticky back at all, while the Twinlock had only just begun to show signs of adhesion loss.

On Day Two, our goal was to complete another 40 mount/remount cycles before cleaning. With the added rest period, we did not make it to 40 cycles before seeing inconsistency in adhesion. This time, we allowed the plate 15 seconds to adhere before each removal and remount. However, we observed significant adhesion loss before we even reached the cleaning phase.

This experiment was conducted under controlled lab conditions and is intended as a preliminary investigation. Future studies should replicate the testing across multiple sleeve types and press environments to strengthen generalizability.

- **For Twinlock:** The sleeve was cleaned with 70% isopropyl alcohol when visual lifting was observed. While still mounted on the sleeve, the plate was cleaned every 40 cycles with 70% isopropyl alcohol on a lint-free cloth.
- **For Stickyback:** The tape was replaced when tackiness diminished and visual lifting occurred. While still mounted on the sleeve, the plate was cleaned every 40 cycles with 70% isopropyl alcohol on a lint-free cloth.

Mounts continued until either material consistently showed plate lift or required replacement or cleaning to maintain adhesion.

Testing Day One Results - Endurance

- Stickyback began lifting at mount 50, and the plate would no longer adhere at remount 100.
- Twinlock began lifting at remount 100 but resumed adhesion after cleaning.

Testing Day Two Results - Efficiency

Round 1

- Stickyback began lifting at mount 50, and the plate would no longer adhere at remount 100.
- Twinlock began lifting at remount 100 but resumed adhesion after cleaning.

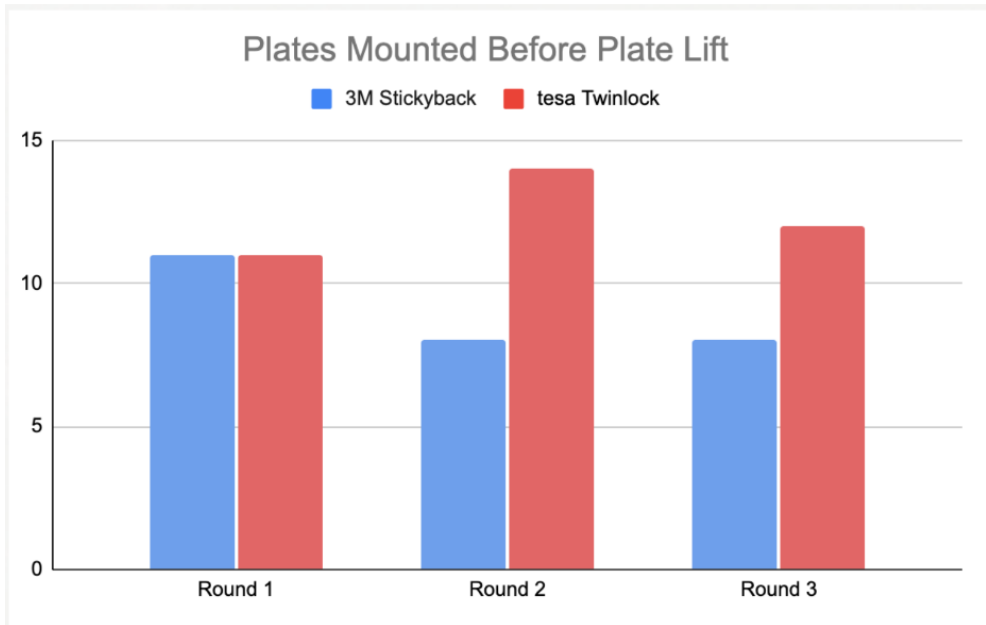
Round 2

- Stickyback showed seam lift at mount 8 and required replacement.
- Twinlock required cleaning at mount 14 to restore full tack.

Round 3

- Stickyback showed seam lift at mount 12 and required replacement.
- Twinlock required cleaning at mount 8 to restore full tack.

Day 2 Test Results - Summary



Material	Average Mounts	Standard Deviation	Cleaning / Replacement Action
3M Sticky Back	9.43	± 3.92	Replace tape after plate lift
tesa Twinlock	13	± 1.79	Clean with isopropyl alcohol after plate lift

Across All Tests

Stickyback began lifting by mount 50 and fully failed by mount 100. Twinlock showed only a minor lift at mount 100 but was fully functional after cleaning. On Day 2, stickyback required replacement after 9.4 mounts (± 3.92), while Twinlock lasted 13 mounts (± 1.79) between cleanings. These results suggest Twinlock is more consistent and requires less maintenance.

- Stickyback lasted an average of 9.43 mounts before failure, with a standard deviation of ± 3.92 .
- Twinlock lasted an average of 13 months before cleaning was needed, with a standard deviation of ± 1.79 .

The lower standard deviation observed with Twinlock (± 1.79) versus stickyback (± 3.92) suggests not only higher durability but also more predictable performance, which is critical in high-volume print environments.

Cost Analysis

While stickyback may appear more affordable at the unit level, long-term use favors reusable sleeves:

Category	3M Stickyback	tesa Twinlock
Unit Cost	~\$25 per roll	~\$600 per sleeve
Lifespan (Mounts)	~50 mounts	~100 mounts (between cleans)
Estimated Cost per 1000 Mounts	~\$1250 (50 rolls)	~\$600 (one sleeve)

You could average around 545 rolls of tape per year, which is up to 5,450 pounds of tape not going to landfill (2020b).

This cost analysis is based on the testing we performed on day one, since replacement procedures may differ in a pressroom setting. Day one testing showed that stickyback began lifting around mount 50 and failed completely by mount 100, while Twinlock maintained adhesion up to 100 mounts before cleaning was required.

This cost analysis does not include the cost of the plate sleeve that the stickyback would be applied to, and does not explore the replacement costs due to damage to these sleeves.

Additional Benefits of Twinlock Include

- **Labor Savings:** Faster setup and does not require constant replacement.
- **Waste Reduction:** No tape disposal.
- **Environmental Impact:** Lower solvent and adhesive waste.

“In 2020, Tesa achieved a 23% reduction in energy-related emissions compared to 2018 levels, in line with our goal of reducing carbon footprint across our supply chain.”

— (Tesa, 2020 Sustainability Report)

Sustainability

Using stickyback for 1,000 mounts creates ~25 lbs of adhesive waste. Over one year, this totals ~1,300 lbs per press. Twinlock eliminates this waste. Reusable coating and re-grind options enhance sustainability. Twinlock also reduces solvent usage by 30% per shift (Tesa, 2023).

Conclusion

Based on both controlled testing and supporting literature, tesa® Twinlock sleeves offer clear advantages over stickyback tape in terms of consistency, reusability, and long-term cost-effectiveness. Stickyback remains a viable solution for short-run jobs or facilities unwilling to invest in Twinlock, but for high-volume pressrooms, Twinlock significantly reduces downtime and waste while maintaining excellent plate adhesion.

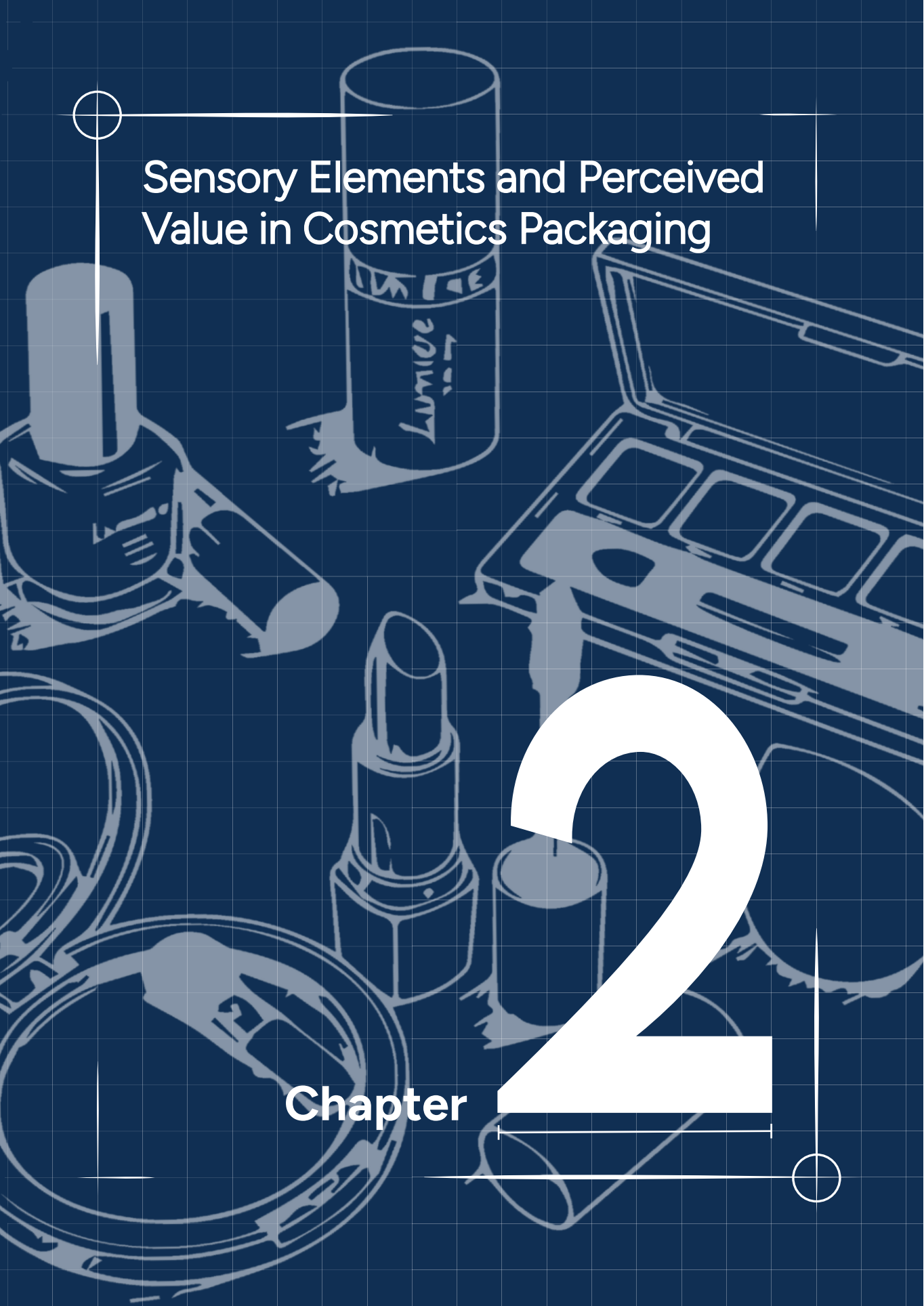
The data also underscores a broader movement within the flexographic industry toward sustainable materials and practices. Any pressroom aiming to reduce cost, increase consistency, and support environmental goals should strongly consider transitioning to reusable sleeve systems. For those with worn or unused sleeves in storage, or those switching to the Twinlock system, retrofitting to Twinlock technology presents an opportunity to turn current inventory into a high-performance tool.

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Sensory Elements and Perceived Value in Cosmetics Packaging

Chapter

2



Sensory Elements and Percieved Value in Cosmetics Packaging

By Laurel Grace Kunkel

Plain Language Abstract

This research looks at how different sensory features of packaging can affect the way Generation Z consumers feel about a product's value. Focusing on a high-end sunscreen brand called Oasis Sunscreen Co., four packages were created with a unique sensory element. 53 college students were surveyed to see which package they preferred. The results showed that the visual aspects of the packaging were the most important, with over half of the participants choosing the visually appealing package as their favorite. Scented packaging also caught people's attention, while features that involved touch were appreciated but not as influential. The study suggests that combining strong visuals with another sensory element could create the best impact. Overall, these findings indicate that engaging consumers' senses is an effective way for brands to connect with Gen Z. By using sensory elements in their packaging, cosmetic companies can create memorable experiences that attract this generation, potentially leading to stronger brand loyalty and increased profits. This research encourages further investigation into the benefits of sensory packaging and highlights the importance for brands to adapt to the changing preferences of consumers.

Abstract

In the competitive landscape of the cosmetics industry, where companies are constantly looking for ways to differentiate themselves, this thesis explores the profound impact of sensory elements on the perceived value of packaging among Generation Z consumers. Through a creative study featuring an upscale sunscreen brand, Oasis Sunscreen Co., four distinct packages were developed, each incorporating a unique sensory element. Surveying 53 college students aged 18-24, the findings revealed compelling insights: visual elements emerged as the most influential in enhancing perceived value and increasing consumers' willingness to pay, with 52% of participants favoring the visual package above all others. The scented packaging also garnered significant attention, while tactile elements were appreciated but less impactful. Further discussion suggests that the integration of a visual element and an additional sensory element might be a key combination for optimal impact. These results demonstrate that sensory engagement is not just a passing trend but a critical strategy for brands aiming to connect with Gen Z. By integrating sensory elements into their packaging, cosmetic companies can create memorable experiences that resonate with this demographic, leading to increased brand loyalty and profitability. This thesis invites further exploration of sensory packaging's potential, emphasizing the need for brands to adapt their strategies to remain relevant in a rapidly evolving marketplace.

Introduction

In an era where consumer experience is paramount, companies are continuously seeking innovative ways to engage their customers. This is especially relevant in the cosmetic and beauty industry, where

competitors struggle to differentiate themselves in a crowded marketplace (Kumar et al., 2006). One such innovation that is setting apart brands is the incorporation of sensory elements into their packaging design (Krishna et al., 2017). Recent studies have shown that adding olfactory, visual, and tactile elements to packaging can evoke powerful emotional responses and significantly influence purchasing decisions (Andrei et al., 2022). This sensory engagement is particularly appealing to consumers of Generation Z, who are drawn to brand experiences that resonate on a personal level and foster deeper connections (Song, 2024). This study will investigate the impact of sensory additions on the perceived value of packaging among Gen Z consumers, methods of implementation and production, surveying consumer responses, analyzing results, and offering conclusions and recommendations for further research. This research centers around the question of “which sensory package has the greatest impact on perceived value”, with the goal of providing insights that allow businesses to evaluate their investment choices more effectively.

Literature Review

There has been recent research focusing on sensory branding and the use of sensory elements in packaging to understand their influence on consumer behavior and brand perception in Generation Z.

A study by Nandagopal in 2015 describes how senses play a role in brand sensory experience and marketing. They defined sensory branding as a type of marketing that appeals to all the senses (sight, smell, touch, sound, taste) in relation to the brand. They also broke down the relationship between senses and perception stating that “customers make buying decisions based on the perception of the brand and that the perception is formed from a collection of stimulations that come from the sensory receptors. A strong brand is one that can capitalize on the human

senses that can enhance, affirm and create trust with the customers” (Nandagopal, 2015). This establishes the relevance of the emerging area of sensory branding and why it should be implemented in package design.

To build upon this, an article was written by Krishna et al. in 2017 to discuss using sensory aspects in packaging as a key marketing tool to make products more engaging. They introduced a taxonomy of packaging based on physicality and functionality. Additionally, they identified the key stages of the multi-sensory customer-brand interaction and discussed new ways of thinking about package design for these stages. This information is key to understanding the relationship between consumer interactions and brand perceptions, and how sensory elements can positively affect this perception.

Furthermore, a study by Heiltjes in 2014 researches brand and product perception and evaluation specifically by evaluating the effects of using tactile elements in packaging in the beverage industry. They found that sensory stimuli in packaging design affects product and brand perception and evaluation, and developed a multisensory packaging strategy for brand owners within the beverage category based on these insights.

Another study explores the impact of the touch sensation on cosmetics packages in a study by Ritnamkam and Chavalkul in 2017. They deemed this an important topic to explore as texture can attract consumers to cosmetic products. They found that several texture design factors were able to elicit feeling words which translated to an emotional experience when consumers interact with the textures. This adds to the research around how sensory elements can positively influence emotions and perceived value.

When considering the effect that senses have on emotions, another key theory that lays the groundwork for this research is emotional branding theory. In a literature review on emotional branding by Akgün, Koçoğlu, and İmamoğlu in 2013, they state emotional branding is “defined

as the engagement of consumers in a deep, long-term, intimate emotional connection with the brand, which creates a special trust based relationship for the development of a holistic emotional experience”. They also establish that getting emotions involved in branding is “crucial for firms in breaking the clutter through claiming distinctive associations in today’s highly saturated environments”. Based on the research above by Ritnamkam and Chavalkul, it is clear that sensory additions to packaging are connected to emotional experiences in consumers. This establishes that sensory additions in packaging are supported by the principles of emotional branding theory.

When considering the demographic of this research, Generation Z, it is important to understand the key attributes of this group. To dive deeper into defining Generation Z, a systematic literature review was conducted by Jayatissa in 2023. The main findings of the review are that Generation Z are born after 1995 and are known as digital natives who are proficient in using technology and social media. They described Gen Z as also possessing unique characteristics such as being entrepreneurial, socially conscious, pragmatic, and diverse.

Further establishing Generation Z’s purchasing preferences, a study by International Council of Shopping Centers (ICSC) in 2023 surveyed 1,008 respondents from Generation Z on their shopping preferences, personal finances, and long-term goals. They emphasize the allure of the physical store within the generation, stating that “Virtually all respondents in our survey (97%) shop at brick-and-mortar stores. Their reasoning? The ability to get items immediately, and the opportunity to see, touch and try products before making a purchase. Meanwhile, others value the opportunity to hang out with friends or enjoy the aesthetic and unique experience of the physical store” (ICSC Survey, 2023). This establishes the value of companies putting effort into an enjoyable in store experience with their products for consumers.

These sources lay the foundation for researching Generation Z’s

preferences on sensory elements, specifically in cosmetics packaging. The cosmetics industry has been continuously growing, earning 108.97 billion dollars in revenue in 2024 and expected to reach 139.29 billion dollars by 2030 (Statista, 2025). Cosmetics companies can use this information to better align their packaging strategies with Gen Z's consumer preferences and industry trends, ensuring they remain competitive and stay relevant in this dynamic marketplace.

Methods and Materials

Overview

To investigate how sensory elements affect the perceived value of packages in the cosmetics industry, I created an upscale and trendy sunscreen brand named Oasis Sunscreen Co. I then produced four nearly identical packages for the brand, each featuring a unique sensory addition. I then crafted a quantitative survey for a group of Gen Z participants to give their opinions on the packages (Appendix A). To authenticate the survey questions, I referenced several similar past studies and then had it reviewed by several researchers. To survey the participants, I set up a table displaying each of the packages in groups of 3. Each sense group was labeled anonymously as either package 1, package 2, package 3, or package 4, so the participants were not aware of which sense was being featured in each package (Figure 3.1).

Package 1 was the olfactory group, package 2 was the control group, package 3 was the visual group, and package 4 was the tactile group. Participants were encouraged to interact with each of the groups of packages with all of their senses as they completed the survey.



Figure 3.1: Survey Table

Participants

In this study, I surveyed 53 college students aged 18-24, 40 females and 13 males. It is important to keep in mind that these participants are a convenient sample consisting of students enrolled in Clemson University's Graphic Communications department and may or may not be more informed or opinionated on sensory packaging elements.

Limitations

The limitations of this study are primarily rooted in the use of a convenient sample, consisting of Clemson Graphic Communications students. This choice may limit the generalizability of the findings, as the perspectives and experiences of this specific demographic may not accurately reflect those of a broader population. Furthermore, each sensory package explored in this research could be represented in various ways. The representations utilized were contingent upon the resources and materials available at the time of the research. Additionally, the impact of sensory elements may differ across product categories beyond

cosmetics and across diverse consumer cultures or socioeconomic groups. As a result, the conclusions drawn from this study should be interpreted with these limitations in mind, acknowledging that alternative representations and a more diverse sample could yield different insights and outcomes. Future research could specifically investigate combinations of sensory elements simultaneously to explore potential interactions and their collective effects.

Package 1: Olfactory

I chose to implement scent to the packages through adding a scented coating to the paper after printing. I ordered a coconut/pina colada scent that reflected the tropical persona of my brand. I printed the package using the inkjet printing process with a Konica Minolta printer. To coat the paper, I used a Kompac EZ Koat 20 coating machine. I decided to pass the papers through the coater twice each, to make sure that the packages would have a strong enough scent to make an impact on people's senses. I then cut the packages out using a Mimaki cutting table that provided accurate cuts and creases for professional looking packages (Figure 3.2).



Figure 3.2: Olfactory Package

Package 2: Control

In order to discover if adding sensory elements to packaging made any difference to the consumer, I created a control package. This had the same basic design as the other packages, without any sensory elements. I printed out these packages using the inkjet printing process with a Konica Minolta printer and cut them out using a Mimaki cutting table that provided accurate cuts and creases for professional looking packages (Figure 3.3).



Figure 3.3: Control Package

Package 3: Visual

To enhance the visual appeal for consumers, I incorporated a foil finish into the blue elements of the package design, giving them a reflective shine. I did this by first printing out a black and white copy of the package using the electrophotography process with the HP Indigo printer. I then ran this copy through a foil applicator machine which was attracted to the black parts of the paper. I then ran the paper back through the HP Indigo to overprint the color onto the paper. To cut, I used a Mimaki cutting table that provided accurate cuts and creases for

professional looking packages (Figure 3.4).



Figure 3.4: Visual Package

Package 4: Tactile

To add a tactile element to this package design, I chose to add a 'soft touch' coating to make the package smooth and soft to the touch. I did this by first printing out the package using the inkjet printing process with a Konica Minolta printer. I then coated the paper using the Kompac EZ Koat 20 coating machine. I passed the papers through the machine twice to get a strong application of the coating. I then used a Mimaki cutting table that provided accurate cuts and creases for professional looking packages (Figure 3.5).



Figure 3.5: Tactile Package

Results

Demographics

The participants in this study are all between the ages of 18-24 with the mode age being 20-21 (53%) and the data skewed slightly to the right. In terms of gender, the participants are 75% female and 25% male. The most common group was females ages 20-21 consisting of 43% of the sample group.

General Perception

The results from the participants established that packaging design and aesthetics play a large role in their purchasing decisions. 87% of participants stated that aesthetics of packaging is either moderately or very important when purchasing cosmetic products. All participants stated that aesthetics were at least somewhat important, with no respondents choosing that packaging aesthetics are not important at all.

How important are packaging aesthetics to you when purchasing cosmetic products? 53 ⓘ

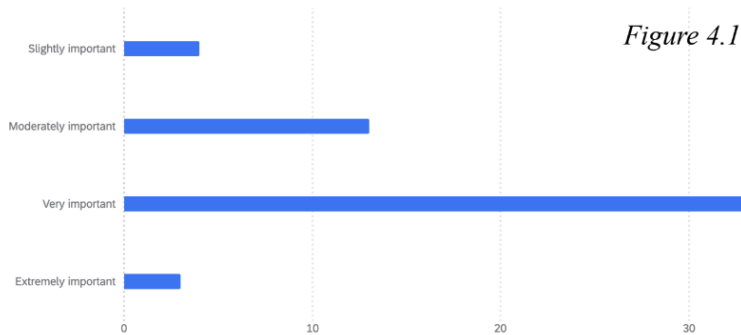


Figure 4.1: Question 3 Results

Figure 4.1: Question 3 Results

Additionally, 85% of respondents stated that they are either somewhat or extremely likely to choose a cosmetic product based solely on its packaging.

Package 1: Olfactory

The results from the scented package are mixed with 19 people saying it is moderately effective, 14 people saying it is slightly effective, and 15 people saying it is very effective at increasing perception of the product's quality. No participants stated that it was not effective at all.

How effective is package 1 at increasing your perception of the product's quality? 53 ⓘ

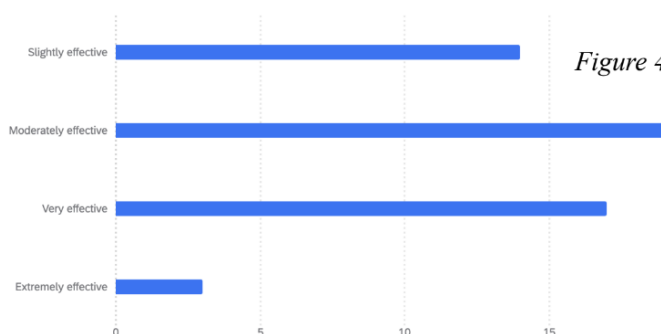


Figure 4.2: Question 5 Results

Figure 4.2: Question 5 Results

60% of participants stated that they would either pay between \$9.00 - \$12.00 or \$13.00 - \$16.00 for the scented package, with the mode being \$13.00 - \$16.00.

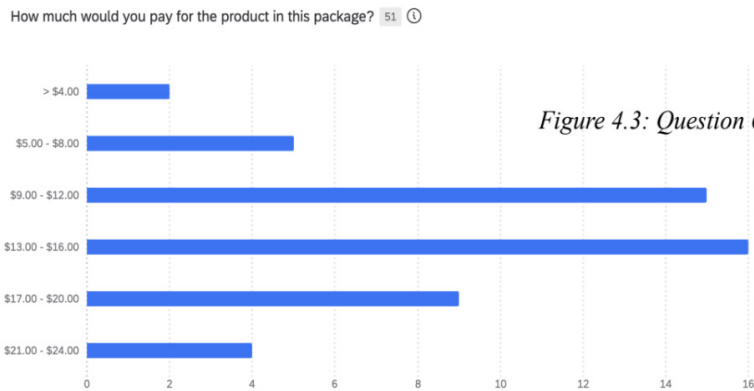


Figure 4.3: Question 6 Results

Figure 4.3: Question 6 Results

Package 2: Control

For the control package, 81% of respondents stated that it was slightly or moderately effective at increasing perception of product value. Only 14% of respondents stated that it was very or extremely effective with 6% stating that it was not effective at all.

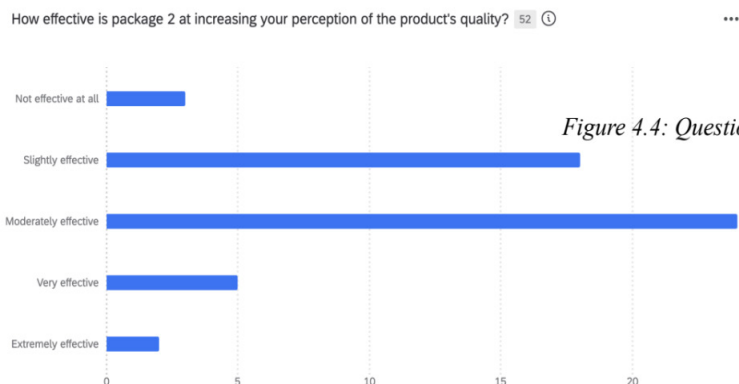


Figure 4.4: Question 7 Results

Figure 4.4: Question 7 Results

The mode for how much respondents would pay for this product was \$9.00 - \$12.00 with 46% of answers indicating that.

How much would you pay for the product in this package? 52 ①

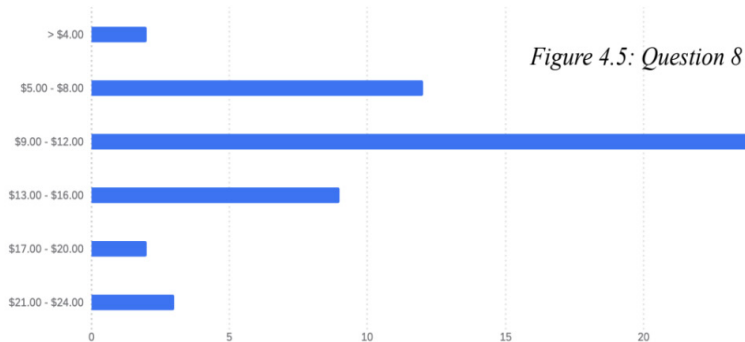


Figure 4.5: Question 8 Results

Figure 4.5: Question 8 Results

Package 3: Visual

For the visual package, the most common answer was that it was very effective at increasing perception of the product. 59% of participants stated that it was very or extremely effective at increasing perceived value.

How effective is package 3 at increasing your perception of the product's quality? 52 ①

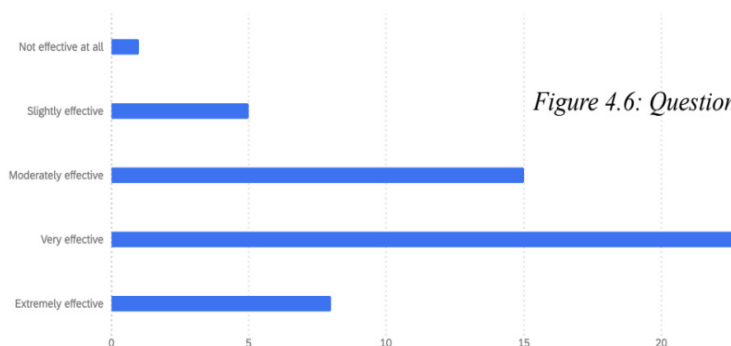


Figure 4.6: Question 9 Results

Figure 4.6: Question 9 Results

Similarly to the scented package, the mode for price willing to pay for this package is \$13.00 - \$16.00. However, more participants were willing to pay higher than the mode with 39% of participants sitting above the mode.

How much would you pay for the product in this package? 52 ⓘ

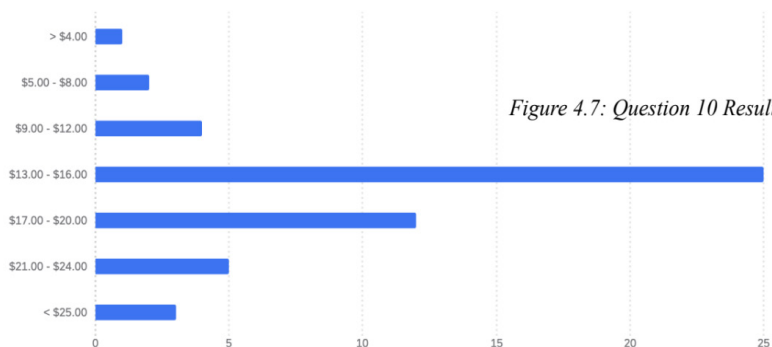


Figure 4.7: Question 10 Results

Figure 4.7: Question 10 Results

Package 4: Tactile

Most participants believed the tactile package was moderately effective at increasing perceived value with 39% of participants choosing this as their answer.

How effective is package 4 at increasing your perception of the product's quality? 51 ⓘ

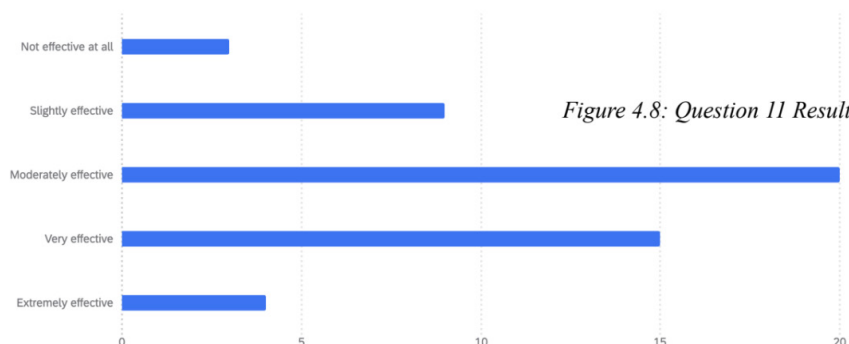


Figure 4.8: Question 11 Results

Figure 4.8: Question 11 Results

The price that participants were willing to pay for the tactile package was almost tied with 16 participants (31%) choosing \$9.00 - \$12.00 and 17 participants (33%) choosing \$13.00 - \$16.00.

How much would you pay for the product in this package? 51 ①

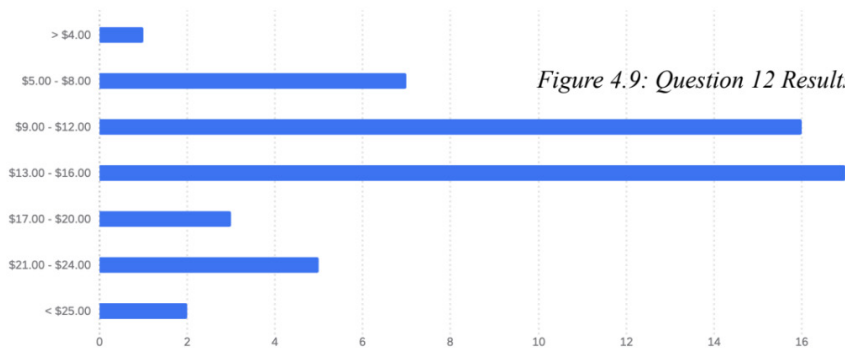


Figure 4.9: Question 12 Results

Figure 4.9: Question 12 Results

Comparative Analysis

When asked to directly compare the packages, 53% of participants chose package 3 (visual) as the most appealing overall. The next most appealing was package 1 (olfactory) at 28%, and then package 4 (tactile) at 20%. No participants chose package 2 (control), establishing that they were able to distinguish the presence of a sensory feature.

Which package did you find most appealing overall? 50 ①

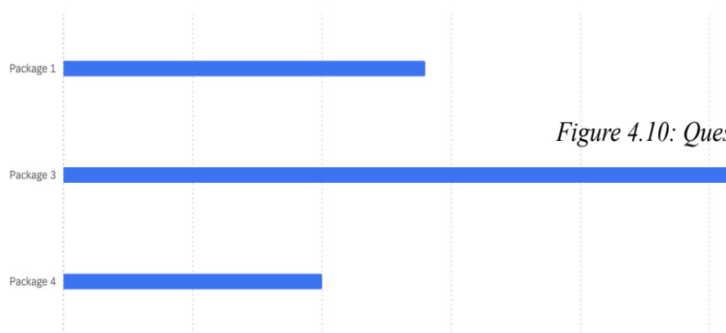


Figure 4.10: Question 13 Results

Figure 4.9: Question 12 Results

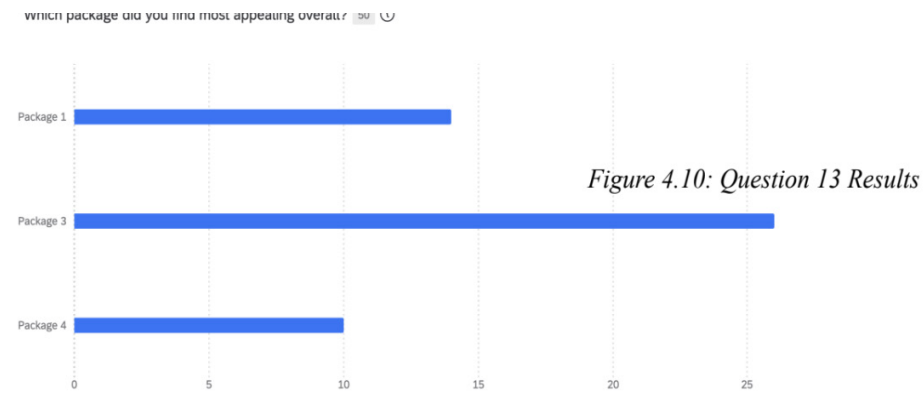


Figure 4.10: Question 13 Results

When asked which package they would pay the most for, most participants answered in line with the previous question with 51% of participants choosing visual, 31% of participants choosing olfactory, 18% of participants choosing tactile, and 0% of participants choosing the control.

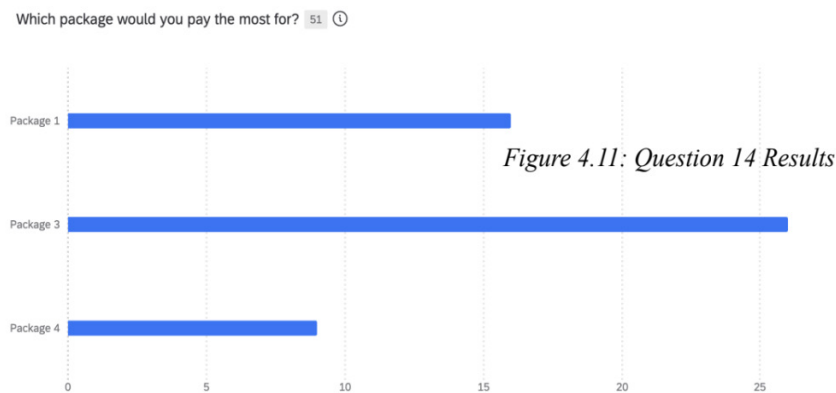


Figure 4.11: Question 14 Results

Finally, participants were asked which package they would choose to purchase if all of these packages were lined up on a store shelf. The overwhelming majority (59%) of participants stated that they would choose to purchase the visual package (package 3). With olfactory and tactile tied at 20% and the control falling last with just 2%.

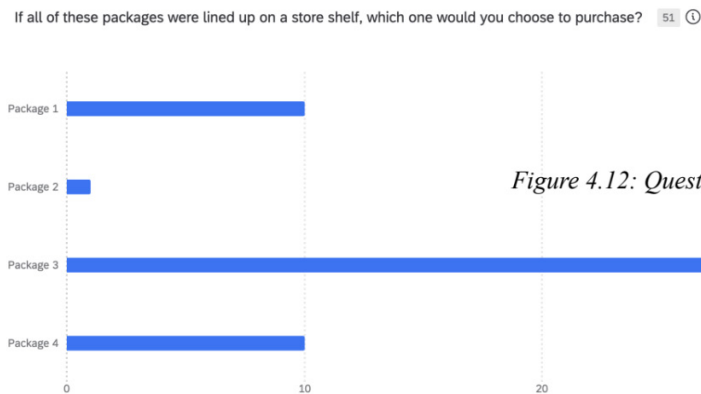


Figure 4.12: Question 15 Results

Figure 4.12: Question 15 Results

Results

At the time of this study using this sample, there are several results that have potential to have practical implications for cosmetic brands targeting Generation Z. To begin, the results of this study established that adding sensory elements is important to the participants, and it does make a difference in their willingness to purchase. In the control package individual analysis, results show a drop in perceived value and in the amount willing to pay for the product compared to the sensory packages. Additionally, it is made clear in the comparative analysis that the participants prefer packages with sensory elements as no participants chose the control package as the most appealing overall package. This result aligns with the existing literature, specifically the research by

Krishna et al. in 2017, that established that sensory additions on packaging as a key marketing tool.

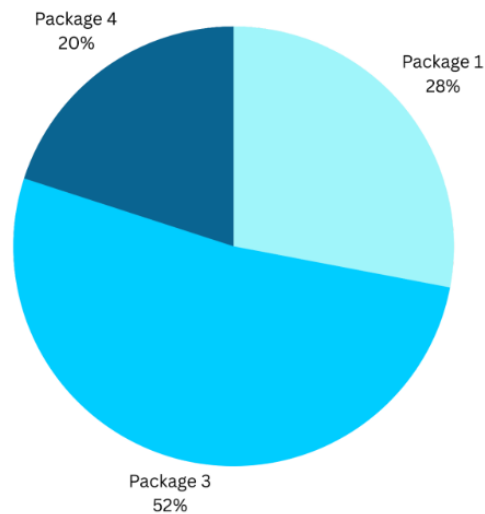


Figure 5.1: Most Appealing Overall Package

To continue, when looking at the individual analysis of each package, results show that visual is the most impactful, then olfactory, then tactile. Traditionally, the sense that is utilized most often when interacting with packaging is visual, so it makes sense that participants would gravitate towards this package. When the participants were interacting with the packages while taking the survey, it was clear that touching and smelling the packages was not their first inclination. However, when they took that next step to smell or touch the package, they had a visible and often audible positive reaction to the presence of the sensory additions. I believe that this is why the olfactory package had mixed results. Those who smelled the scent rated the package high, but those who did not rated similar to the control. This leads to the idea that a package that incorporates a visual sensory element to draw consumers in, and then adds a tactile or olfactory sensory element to create a memorable

experience, could potentially be very effective overall at increasing brand perceived value and profits. It is interesting to consider these findings when looking back at the study by Ritnamkam and Chavalkul in 2017, that only researched tactile sensory additions of cosmetics packaging. Perhaps if they had tested out different sensory additions or combinations, they would have also seen that tactile elements by themselves did not have the most impact on perceived value.

In terms of cost and willingness to pay, in all of the packages the levels of perceived value correlated with the price the participants were willing to pay. It is important to notice that the package that people perceived as the most expensive (visual, package 3) is also the package that the participants most often chose that they would pick off a shelf to buy. This supports the idea that Generation Z is willing to pay more for these packages, and companies can capitalize off of this if they effectively implement visual sensory elements in their packaging. This is illustrated by the fact that 87% of participants stated they would pay \$13.00 or above for the product in the visual package, while only 27% of participants stated they would pay \$13.00 dollars or above for the product in the control package.

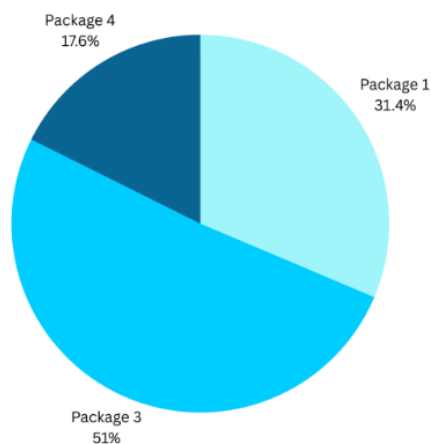


Figure 5.2: Would Pay Most For

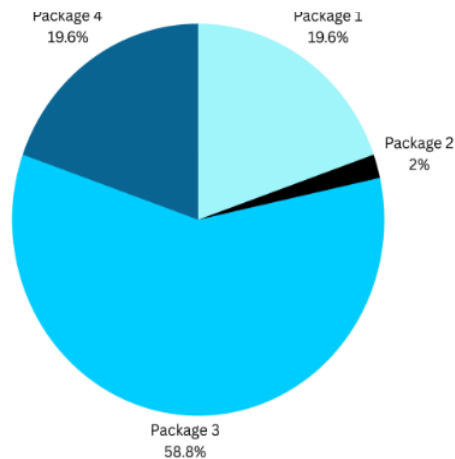


Figure 5.3: Would Choose Off Shelf

When it comes to male and female preferences, most male answers proportionally reflected the female answers. There was no significant difference in preference between females and males. To see the comparative analysis section broken down between demographics, refer to Appendix B.

Conclusions

In conclusion, this study has illuminated the significant impact that sensory elements in packaging design can have on the perceived value of cosmetic products among Generation Z consumers. By exploring four distinct packaging variations, olfactory, visual, tactile, and a control group, I was able to gather valuable insights into the preferences and purchasing behaviors of this demographic. The findings reveal that sensory additions, particularly visual elements, not only elevate the perceived value of products but also strongly influence consumers' willingness to pay higher prices. Notably, the visual package emerged as the most appealing option, with participants consistently demonstrating

a preference for it over the control and other sensory packages.

The importance of these findings extends beyond the immediate context of this study. As the cosmetic industry continues to evolve, understanding the preferences of Generation Z, a cohort that is increasingly becoming a dominant force in consumer behavior, provides valuable implications for brands looking to connect with this audience. The results suggest that companies can enhance their market positions by integrating sensory elements into their packaging strategies, thereby fostering deeper emotional connections with consumers. While the limitations of this study, particularly the reliance on a convenient sample from Clemson Graphic Communications students, may restrict the generalizability of the conclusions, they nonetheless point to a broader trend that could resonate with the greater Gen Z population. Additional statistical analysis in future studies using regression analysis should be used to further confirm the significance of these findings. Future research should aim to explore dynamics across diverse consumer groups and industries, which could improve external validity and further investigate the effectiveness of sensory packaging strategies in enhancing brand value and driving sales. Future studies might also explore the interplay between multiple sensory elements in packaging that could yield deeper and more specific insights into consumer preferences.

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Appendix A

The following is a short survey concerning sensory experience in packaging. You will be presented with four distinct packages. Take a moment to observe each one carefully, considering the sensory attributes such as visual appeal, scent, and texture (if applicable).

Start of Block: Demographics

1. What is your age?

- 18-19
- 20-21
- 22-23
- 24+

2. What is your gender?

- Male
- Female
- Non-binary / third gender
- Prefer not to say

End of Block: Demographics

Start of Block: General Perception

3. How important are packaging aesthetics to you when purchasing cosmetic products?

- Not at all important
- Slightly important
- Moderately important
- Very important
- Extremely important

4. How likely are you to choose a cosmetic product based solely on its packaging?

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

End of Block: General Perception

Start of Block: Package 1 Analysis

5. How effective is package 1 at increasing your perception of the product's quality?

- Not effective at all
- Slightly effective
- Moderately effective
- Very effective
- Extremely effective

6. How much would you pay for the product in this package?

(x) > \$4.00 ... < \$25.00

End of Block: Package 1 Analysis

Start of Block: Package 2 Analysis

7. How effective is package 2 at increasing your perception of the product's quality?

- Not effective at all
- Slightly effective
- Moderately effective
- Very effective
- Extremely effective

8. How much would you pay for the product in this package?

(x) > \$4.00 ... < \$25.00

End of Block: Package 2 Analysis

Start of Block: Package 3 Analysis

9. How effective is package 3 at increasing your perception of the product's quality?

- Not effective at all
- Slightly effective
- Moderately effective
- oery effective
- Extremely effective

10. How much would you pay for the product in this package?

(x) > \$4.00 ... < \$25.00

End of Block: Package 3 Analysis

Start of Block: Package 4 Analysis

11. How effective is package 4 at increasing your perception of the product's quality?

- Not effective at all
- Slightly effective
- Moderately effective
- Very effective
- Extremely effective

12. How much would you pay for the product in this package?

(x) > \$4.00 ... < \$25.00

End of Block: Package 4 Analysis

Start of Block: Comparative Analysis

13. Which package did you find most appealing overall?

- Package 1
- Package 2
- Package 3
- Package 4

14. Which package would you pay the most for?

- Package 1
- Package 2
- Package 3
- Package 4

15. If all of these packages were lined up on a store shelf, which one would you choose to purchase?

- Package 1
- Package 2
- Package 3
- Package 4

End of Block: Comparative Analysis

Appendix B

Comparative Analysis Demographic Breakdown

Which package did you find most appealing overall?

Count of Response	Column Labels			
Row Labels	Package 1	Package 3	Package 4	Grand Total
Female	11	22	6	39
18-19	2	6	3	11
20-21	6	13	3	22
22-23	3	3		6
Male	5	4	3	12
18-19	1		2	3
20-21	2	2	1	5
22-23	1	2		3
24+	1			1
Grand Total	16	26	9	51

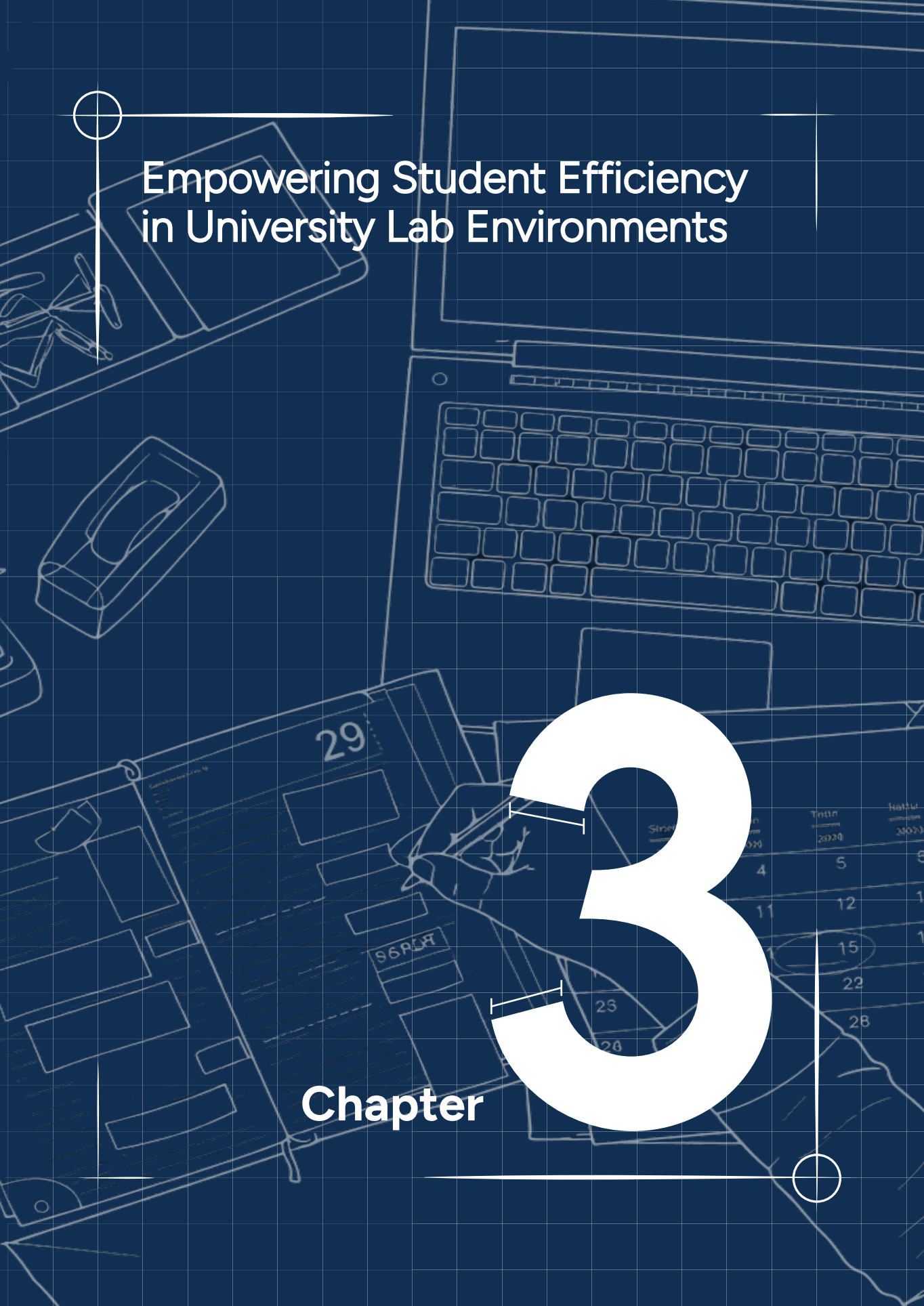
Which package would you pay the most for?

Count of Response	Column Labels			
Row Labels	Package 1	Package 3	Package 4	Grand Total
Female	12	19	8	39
18-19	4	4	3	11
20-21	5	12	5	22
22-23	3	3		6
Male	1	2	7	10
18-19	1		2	3
20-21		1	4	5
22-23		1	2	3
24+			1	1
Grand Total	14	26	10	50

If all of these packages were lined up on a store shelf, which one would you choose to purchase?

Count of Response	Column Labels				
Row Labels	Package 1	Package 2	Package 3	Package 4	Grand Total
Female	7		24	8	39
18-19	1		7	3	11
20-21	4		13	5	22
22-23	2		4		6
Male	3	1	6	2	12
18-19	1			2	3
20-21		1	4		5
22-23	1		2		3
24+	1				1
Grand Total	10	1	30	10	51

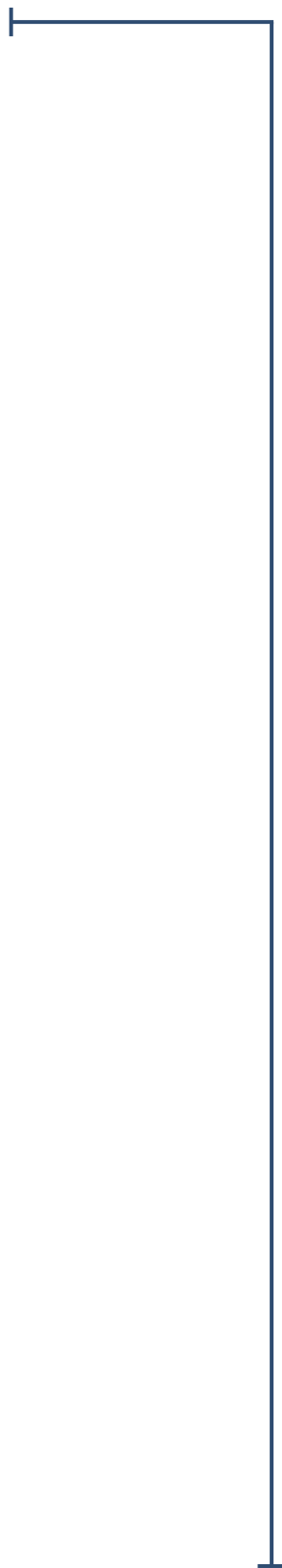
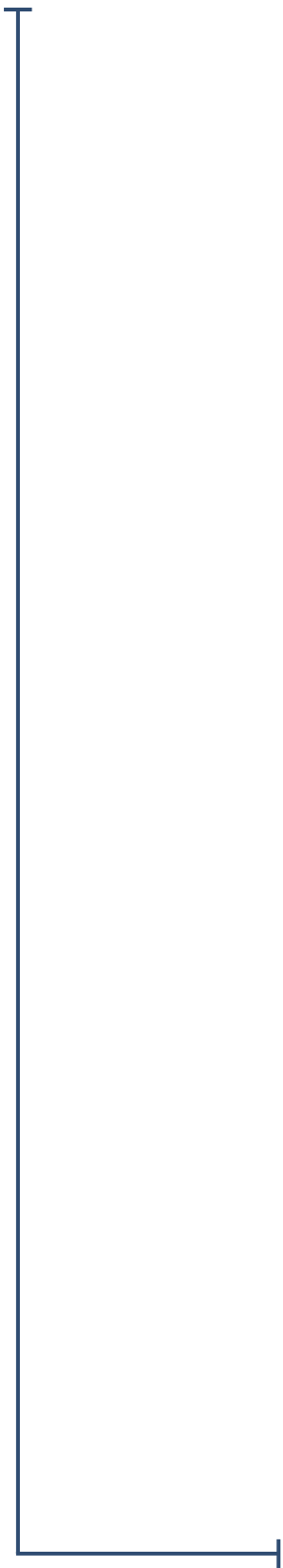




Empowering Student Efficiency in University Lab Environments

Chapter

3



Empowering Student Efficiency in University Lab Environments: Designing the Clemson GC Lab Scheduler

By Sana Khan

Abstract

This study presents the development and implementation of the Clemson GC Lab Scheduler, a digital tool designed to streamline task scheduling and resource management for Graphic Communications students at Clemson University. The tool addresses the challenge of organizing lab access and equipment use in a high-demand academic environment, where efficient scheduling is essential for maximizing student productivity and lab resources. Built using the MERN (MongoDB, Express.js, React.js, Node.js) stack, the Clemson GC Lab Scheduler allows students to schedule tasks by specifying course number, machine type, task duration, and desired time slot. The application also offers functionality to view scheduled tasks, access relevant tutorials, and manage user accounts through secure registration and login features.

The application incorporates an administrative dashboard enabling staff to add or modify available courses, machines, and faculty approval settings, as well as manage tutorial resources and broadcast

maintenance updates. To ensure seamless coordination, automated email notifications facilitate faculty approval for specific equipment use, providing a clear and structured process for high-demand machines.

The study evaluates the application's impact on student efficiency, accessibility, and resource utilization in the Clemson GC lab. Through user-centered design principles and rigorous testing, this project demonstrates how digital solutions can effectively address logistical and operational challenges within university lab environments. The Clemson GC Lab Scheduler represents a model for integrating scheduling solutions in academic settings, with potential for adaptation across similar institutions. This research underscores the value of specialized scheduling tools in enhancing student experience and optimizing resource management in technical education labs.

Chapter One

Introduction

The Clemson GC Lab Scheduler is a web-based application to streamline the scheduling of lab tasks for Graphic Communications students at Clemson University. This tool addresses the need for a centralized, efficient, and user-friendly system that allows students to schedule and manage their lab activities in the GC lab.

The scheduler enables students to select specific tasks, machines, and time slots, while also providing access to relevant tutorials and a comprehensive view of their scheduled activities. Additionally, an admin dashboard allows faculty and lab staff to manage resources, add or update courses and machines, and communicate essential maintenance information, creating an organized and adaptable lab environment.

Purpose and Objectives

The purpose of this project is to design and develop a GC Lab Scheduling System for Clemson Graphic Communications students and faculty. This system aims to provide a centralized platform for viewing lab activities, scheduling tasks, and facilitating faculty approvals, addressing the existing challenges of limited visibility and inefficient scheduling in the printing lab. Key objectives of this project include:

1. Research and plan a user-centric scheduling tool to allow students to organize tasks by specifying course, machine type, duration, and time slot.
2. Providing a clear, streamlined interface for students to view their scheduled tasks and access tutorial resources.

Through these objectives, the project aims to offer a scalable solution for scheduling in high-demand academic labs.

Importance to Graphic Communications Students

For Graphic Communications students, the GC Lab Scheduler addresses significant challenges in lab access and equipment usage. The hands-on nature of their coursework requires frequent access to specialized machinery, making effective scheduling essential for project completion and skill development. This tool not only enhances students' ability to manage their lab time efficiently but also ensures they have access to necessary tutorials and guidelines for each machine. By providing a clear, organized scheduling system, the Clemson GC Lab Scheduler ultimately supports students in optimizing their time, fostering learning opportunities, and better managing their academic responsibilities.

Chapter Two

Literature Review

Scheduling in academic lab environments poses unique challenges, particularly in fields that rely heavily on specialized equipment, such as Graphic Communications, engineering, and the health sciences. Previous studies have highlighted the logistical inefficiencies that arise from traditional scheduling methods, like paper-based sign-ups or uncoordinated online forms, which often lead to scheduling conflicts, underutilization, and prolonged wait times. Automated scheduling systems have been explored as a solution, demonstrating improvements in efficiency and resource allocation. For instance, Diallo and Tudose (2024) introduced a multi-objective optimization model to automate teaching activity scheduling in faculty settings, thereby reducing administrative workload and ensuring equitable resource distribution among students and staff (Diallo & Tudose, 2024).

The Role of Digital Solutions in Educational Lab

Digital scheduling solutions have increasingly been implemented in academic labs to streamline workflow, optimize resource usage, and minimize human error. Studies show that such systems not only provide real-time updates on equipment availability but also enable personalized access, scheduling reminders, and access to tutorials, which significantly enhance the user experience in academic settings. For example, Montemezzi et al. (2021) reviewed digital management systems in health sciences labs, noting how these tools improve lab workflows, data

traceability, and operational efficiency, while also promoting best practices among users (Montemezzi et al., 2021). Similarly, automated timetable generation systems, such as those discussed in the AIP Conference Proceedings, demonstrate the adaptability and scalability of digital scheduling solutions across a range of educational and lab environments (AIP Conference Proceedings, 2024).

Scheduling Tools and Resource Management in University Settings

Centralized scheduling systems in university environments have been found to improve student access to resources, reduce conflicts, and prevent resource underuse or overuse. Research into digital scheduling tools, such as the one by Stephen F. Austin State University (2022), underscores the importance of adaptable scheduling systems in effectively allocating resources in high-demand environments. By reducing manual intervention, these tools enable faculty and students to more efficiently manage shared lab resources, while also accommodating real-time updates and modifications based on institutional needs (Stephen F. Austin State University, 2022). Additionally, automated systems that integrate conflict resolution algorithms, as described by recent studies in IEEE, further ensure that resource utilization is maximized while keeping scheduling conflicts to a minimum (IEEE Explore, 2023).

Importance of Numerical Ranking System to Prioritize and Manage Tasks

In their study, Manvi and Murthy (2016) introduce Task Matrix, a task management tool that employs a numerical ranking system to prioritize and manage tasks. The system is designed to help users efficiently evaluate and organize actions based on predefined criteria such as importance, urgency, or other relevant factors. This innovative approach streamlines decision-making by providing a structured and quantifiable framework for task prioritization.

The authors highlight the increasing need for tools that enhance productivity in environments where users face numerous competing priorities. Task Matrix addresses this challenge by enabling users to rank tasks and allocate resources effectively, ensuring that critical tasks are completed on time while less urgent ones are appropriately deferred. The ranking system converts subjective evaluations into measurable scores, making it easier for users to assess their workload objectively.

The study also examines the implementation and performance of Task Matrix in real-world scenarios, demonstrating its potential to reduce cognitive load and improve task efficiency. By converting subjective task evaluation into quantifiable data, the tool empowers users to manage their time and resources more effectively.

Chapter Three

Research Methodology

The methodology of this project involved a mixed-methods approach to gather insights into the scheduling needs and challenges faced by Graphic Communications (GC) students at Clemson University.

I used a survey to collect data, supplemented by observations of lab usage patterns, and extensive personal experience using the lab to assess peak times. This combination of quantitative and qualitative data allowed for a comprehensive understanding of both user needs and current inefficiencies in the lab scheduling process.

Market Research

To inform the development of the Lab Activity Scheduler, a comparative analysis of existing tools was conducted, focusing on their strengths, weaknesses, and relevance to the scheduling needs of Clemson Graphic Communications students. The analysis included Asana, Airtable, and ClemsonGC Gear Rental.

Asana

Strengths:

- Comprehensive task management capabilities.
- Flexible scheduling options suitable for team collaboration.
- Task prioritization features for effective organization.
- Integration with other platforms enhances usability.

Weaknesses:

- Steep learning curve for new users.
- Premium features are subscription-based, increasing costs.
- Asana provided insights into structuring a collaborative scheduling system and implementing prioritization tools but lacked suitability for a lab-specific context.

Airtable

Strengths:

- Simple, user-friendly interface that serves as inspiration for intuitive design.
- Ideal for project management with real-time collaboration capabilities.
- Customizable templates that align with scheduling workflows.

Weaknesses:

- Scalability issues for handling larger databases.
- Advanced features require a paid subscription.
- Limited integration flexibility compared to Asana.
- Airtable's simplicity and collaborative features informed the design of the user interface but highlighted the need for scalability in a dedicated scheduling tool.

ClemsonGC Gear Rental

Strengths:

- Published through ClemsonGC's WordPress platform for easy accessibility.
- Tutorials page adds educational value for users.

Weaknesses:

- Reliance on Google Forms limits customization and functionality.
- No real-time scheduling table to streamline reservations.
- The ClemsonGC Gear Rental system emphasized the importance of integrating tutorials and accessibility but demonstrated the need for more robust scheduling capabilities, including real-time updates.

Market Research

The survey was conducted among GC students and was designed to collect information on lab usage frequency, preferred machines, current scheduling methods, and the challenges faced when booking lab

time. Participants were also asked about their interest in potential features for a centralized scheduling system, such as machine availability, task-specific tutorials, and estimated job completion time calculators. The responses indicated a strong need for a streamlined, accessible platform, with many students expressing difficulties in coordinating schedules informally.

Observation and Testing in the Lab

In addition to the survey, I conducted several rounds of observation in the GC lab to identify peak usage times and availability constraints. This hands-on experience was essential to understand the practicalities of lab management and to identify the times when access to machines is most competitive. These insights were integral to designing a scheduling tool that not only aligns with student preferences but also optimally distributes machine usage across different time slots.

Lab Usage Patterns

The survey included responses from students enrolled in or who had previously completed Graphic Communications lab courses. The frequency of lab usage varied among respondents, with approximately 20% using the lab more than five times a week, 60% using it two to three times weekly, and 15% reporting occasional use (one to two times a month). A minority (~5%) indicated rare or minimal use of the lab facilities.

Among the machines used, the Konika Minolta Inkjet Printer emerged as the most frequently utilized equipment, followed by the Flexo Printer, Cutting Machines, and Mimaki Wide Format Inkjet Printer. The Digital Printer and Ink & Substrates Lab Equipment also saw notable usage. These findings underscore the diversity in equipment preferences, reflecting the multifaceted nature of lab activities.

How often do you use the GC labs?

49 responses

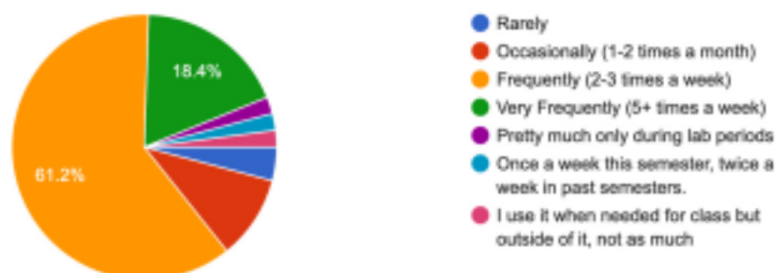


Figure A-1: Frequency of Lab Usage by GC Students

Which machine do you use the most in the lab?

49 responses

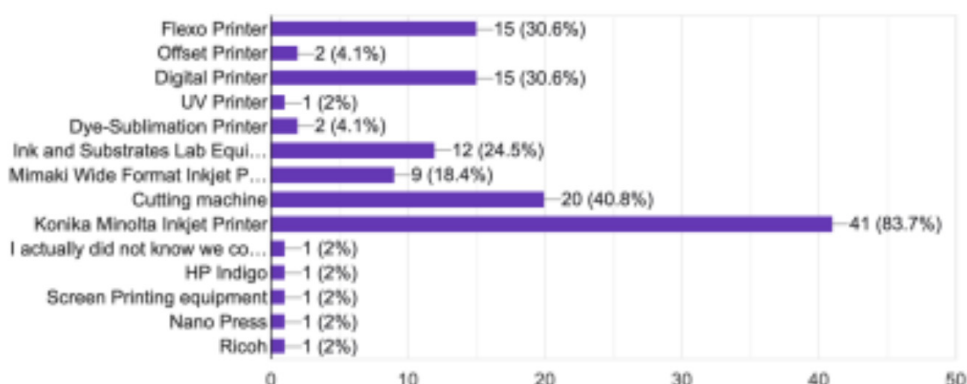


Figure A-2: Preferred Machines Used in GC Labs

Current Scheduling Methods

Respondents revealed a reliance on informal scheduling methods, with GroupMe, iMessage, and other peer-coordination tools accounting for over 50% of scheduling practices. Approximately 30% of students reported checking machine availability upon arrival at the lab, while others (~15%) utilized lab sign-up sheets. A minimal percentage indicated they relied on pre-assigned lab times.

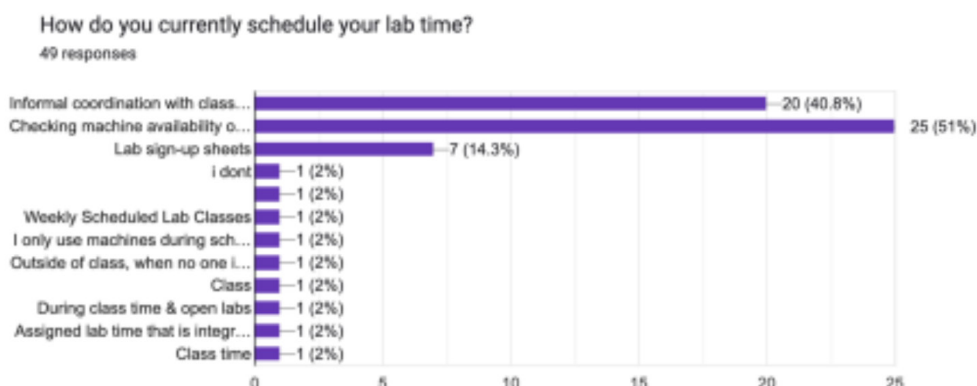


Figure A-3: Current Scheduling Methods Used by Students

These findings highlight a lack of a standardized system, with many students relying on ad-hoc arrangements that may contribute to inefficiencies and conflicts. This data is visually presented in Figure A-3, illustrating the distribution of current scheduling methods.

Challenges in Scheduling

When asked about issues related to lab scheduling, 40% of respondents admitted to experiencing occasional conflicts, particularly concerning machine availability and overlapping schedules with classmates. However, 60% stated they did not face significant issues, potentially due to their reliance on assigned or informal coordination mechanisms.

Open-ended responses provided further qualitative insights. For example, one respondent highlighted frustration with “not knowing if a machine is already in use or how long it might be occupied.” Another noted the inconvenience of scheduling conflicts during peak lab usage times.

Interest in Proposed Features

Respondents demonstrated significant interest in the proposed features of a centralized scheduling tool, emphasizing its potential

to address their challenges effectively. One of the most valued features was the ability to check machine availability, with 80% of respondents rating this functionality as “Very Helpful.” This reflects the frequent difficulties students face in determining whether specific equipment is in use, leading to inefficiencies and wasted time.

Similarly, 70% of respondents rated the feature for scheduling lab time through a centralized platform as “Very Helpful.” This suggests that students recognize the need for a standardized system to replace informal methods, which often lead to scheduling conflicts or lack of clarity about lab access.

How helpful would it be to have a centralized website to schedule lab time?

49 responses

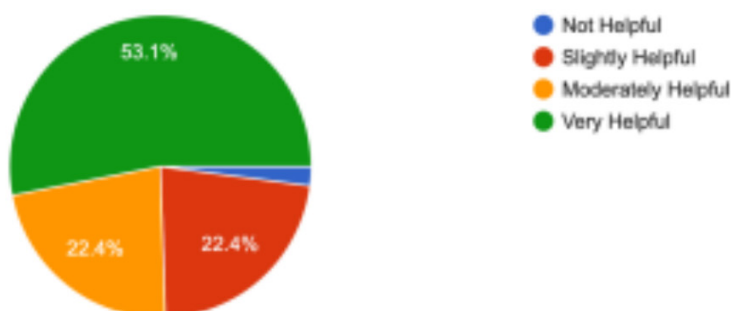


Figure A-3: Helpfulness Ratings of a Centralized Website to Schedule Lab Time

Additionally, approximately 75% of respondents expressed that task-specific tutorials integrated into the scheduling system would be “Very Helpful.” This highlights a clear demand for guidance on completing specialized tasks, such as mounting flexo plates, which require technical precision and are not always covered in class. The inclusion of such tutorials would enhance student confidence and efficiency while using lab equipment.

Would you use an estimated job completion time calculator in the app to better plan your lab time?
49 responses

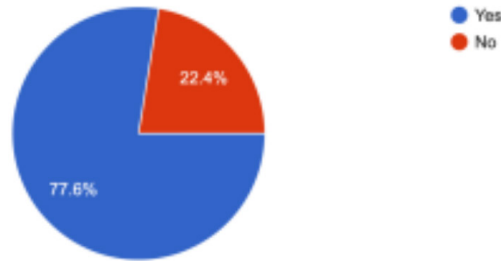


Figure A-3: Respondents' Interest in a Job Completion Time Estimator

The survey results validate the need for a centralized lab scheduling tool tailored to the needs of Clemson GC students. Current practices lack standardization and lead to inefficiencies, while the proposed features align closely with student preferences and address critical pain points. The findings support the hypothesis that a structured, feature-rich tool will significantly enhance the lab scheduling experience.

User Persona

To better understand the target audience for the lab scheduling system, two user personas were developed based on survey responses and observed challenges. These personas—Riley Carter and Jake Thompson—represent typical users with distinct needs, frustrations, motivations, and goals. They guided the design and development process by providing a clear focus on user-centric solutions.

Persona 1: Riley Carter

- **Demographics:** Riley Carter is a junior, a 3rd-year student in Graphic Communications, balancing a demanding schedule of coursework

(GC 4061 and GC 4401) alongside a part-time job.

- Needs: Riley needs a centralized scheduling system that allows her to remotely check machine availability and optimize her limited time. This would help her avoid unnecessary trips to the lab.
- Frustrations: Due to her tight schedule, Riley often struggles to find free machines. She frequently calls friends to check availability, a method that is neither reliable nor efficient.
- Motivations: Riley is motivated by the need to complete lab assignments efficiently without disrupting her work-life balance. She aims to maximize productivity during the limited lab time she can access.
- Goals: Her primary goals include scheduling lab time in advance to ensure machine availability and avoiding the hassle of coordinating with others or making unnecessary visits to the lab.

Persona 2: Jake Thompson

- Demographics: Jake Thompson is a senior in Graphic Communications, enrolled in lab-intensive courses (GC 4441 and GC 3461). He requires lab access to complete coursework and projects.
- Needs: Jake needs a scheduling tool that allows him to book machines for evening sessions after his classes. A clear overview of machine availability is essential to avoid conflicts and waiting times.
- Frustrations: Jake often faces inconsistent access to lab machines during peak times. This leads to wasted time waiting for machines or coordinating with others.
- Motivations: He is driven by the need to complete his projects efficiently and meet course deadlines. Minimizing downtime is critical for him to stay on track.
- Goals: Jake's goals are to effectively use the lab during late hours and ensure a smoother workflow by pre-scheduling tasks to avoid last-minute disruptions.

Chapter Four

The Design Process

The design process for the GC Lab Scheduling System was deeply rooted in branding consistency and user-centered design principles. I began by researching Clemson Graphic Communications (GC) branding guidelines to ensure the tool would align with the department's established visual identity. By integrating familiar Clemson GC elements, I aimed to create an interface that students would recognize and trust.

Branding and Visual Consistency

To create a cohesive experience, I examined Clemson University's official branding elements, such as color schemes, typography, and iconography, to reflect the university's identity within the tool. This research informed my choice of colors and fonts, ensuring that they aligned with Clemson's style while enhancing readability and accessibility. This consistency was important to establish trust and familiarity among users, making the tool feel like an extension of existing GC resources.

Design Objectives

- **Simplicity:**
 - Minimalistic layouts to reduce cognitive load and make navigation intuitive.
 - Uncluttered screens focusing on the primary tasks and goals of the user.
- **Consistency:**
 - Uniform use of colors, typography, and button styles across all

pages to create a seamless experience.

- Accessibility:
 - High-contrast elements and scalable typography for inclusive design.
- Responsiveness:
 - The design adapts seamlessly across devices to ensure usability on both desktops and mobile devices.

Style Guide

Color Palette

Primary Colors:

- Orange (#F56600) for actionable elements like buttons to ensure visibility and alignment with Clemson's branding.
- Purple (#2E1A47) for headings and accents, maintaining consistency with Clemson's official colors.
- Neutral tones like dark gray (#333333) for text and supporting elements to enhance readability.

	RGB	HEX
	241, 196, 0	☐#F56600
	173, 26, 172	☐#333333
	173, 26, 172	☐#2E1A47

These colors were chosen for their clarity and strong visual hierarchy, ensuring critical information stands out.

Typography

- Headings: Tiempos Headline (Semibold, Bold, and Black) for titles and headers to convey professionalism and structure.
- Body Text: Kumbh Sans (Regular, Medium, and Semibold) for descriptions and paragraphs to ensure readability and a clean, modern look.
- This combination of serif and sans-serif fonts balances elegance with functionality.

Kumbh Sans

Regular
Regular italic

Medium
Medium Italic

Semi Bold
Semibold Italic

Tiempos Headline

Semibold
Semibold Italic

Bold
Bold Italic

Black
Black Italic

Figure B-1: Fonts selected to be used for the lab scheduler tool

Buttons and CTAs

- Bright orange buttons (#F56600) with bold, uppercase text for high visibility and user engagement.
- Neutral tones like dark gray (#333333) for text and supporting elements to enhance readability.

BUTTON

Logo

- The logo integrates Clemson's signature orange and purple, with a modern typographic treatment that aligns with the clean design ethos of the platform.
- The circular "GC" symbol reflects the inclusive and collaborative nature of the scheduling system.



Figure B-2: Lab Activity Scheduler logo

User Workflow

The user workflow for the Lab Activity Scheduler is designed to be intuitive and efficient, ensuring that users can navigate the system with minimal effort while accomplishing their tasks seamlessly. The workflow prioritizes simplicity while incorporating all essential functionalities to enhance the overall user experience.

Login/Register

The entry point for users is the Login/Register page, where new users can create an account, and returning users can log in securely. The system uses a passkey and OTP-based authentication to ensure data security.

Home Page

After logging in, users are directed to the Home Page, which serves as the central hub for navigation. From here, users can quickly access all primary functionalities:

Schedule a Task: Users can schedule lab time by specifying the machine, task, date, and time. The interface is designed to minimize effort and maximize clarity. Real-time machine availability is displayed to avoid scheduling conflicts.

Scheduled Tasks: A consolidated view of all scheduled tasks, allowing users to manage or modify their bookings. The "Share" functionality has been relocated here for better usability, enabling users to share their schedule with team members or faculty.

Tutorials: Users can access step-by-step guides and instructional materials specific to lab equipment and tasks. This feature supports new or less experienced students by reducing dependency on lab staff.

Logout: A straightforward logout option ensures users can exit their session securely. Or in a situation where another user needs to use the same browser to sign in to a session.

Efficiency in Workflow

The design of the workflow focuses on streamlining navigation with direct links from the home page to all essential functions. By minimizing the number of clicks required to perform tasks, the system enhances productivity and user satisfaction.

Consideration for an Admin Dashboard

Although this workflow is user-centric, future iterations will include an Admin Dashboard to support easier database management and oversight. The dashboard will allow administrators to manage user accounts, approve scheduling requests, and ensure optimal usage of lab resources.

Prototype

The prototype for the Lab Activity Scheduler was developed using Figma, leveraging the platform's versatility for creating interactive and visually consistent user interface designs. The design reflects the previously established user workflow, emphasizing an intuitive, efficient, and user-friendly experience.

Design and Features Login/Register:

The entry point for users, ensuring secure access to the tool through a clean and minimalistic interface. Includes fields for username and password, maintaining Clemson's branding through the use of its signature colors and typography.

Lab Activity Scheduler

LOG IN | REGISTER

+ SCHEDULE A TASK | SCHEDULED TASKS | TUTORIALS

LOG IN

USER NAME

PASSWORD

LOG IN

REGISTER

Figure B-3: Login page

Home Page: Acts as a central navigation hub with direct links to key features such as Schedule a Task, Scheduled Tasks, Tutorials, and options for account management.

Lab Activity Scheduler

LOG IN | REGISTER

+ SCHEDULE A TASK | SCHEDULED TASKS | TUTORIALS

SCHEDULED TASKS

Task Name	Machine	Estimated time of completion	Scheduled date	Scheduled time
Screen printing	-	2 hours	October 20, 2024	13:00
Flexo Printing	Nilpeter Press	2 hours	October 22, 2024	14:00
Flexo printing	Comco Press	2 hours	October 22, 2024	10:00

Figure B-4: Home page

Schedule a Task: The core functionality of the system, allowing users to:

- Select machines.
- Enter task details.
- View available time slots.
- Send requests for faculty approval if required.

A unique feature, “Estimate it for me”, calculates task duration to help users plan more effectively.

[→ SCHEDULE A TASK](#) | [SCHEDULED TASKS](#) | [TUTORIALS](#)

SCHEDULE A TASK

Task Name

Course

Machine [+Add more](#)

Estimated time required to finish the task:

Estimate it for me ☐ 00:09:00

Available time slot

January 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

8:30	8:45	9:00	9:15
9:30	9:45	10:00	10:15
10:30	10:45	11:00	11:15
11:30	11:45	12:00	12:15
12:30	12:45	13:00	13:15
13:30	13:45	14:00	14:15
14:30	14:45	15:00	15:15
16:30	16:45	17:00	17:15
17:30	17:45	18:00	18:15
18:30	18:45	19:00	

Sunday, January 23

This machine requires faculty permission/ availability. Send for approval? ☒

I need tutorial for this job ☐

[SCHEDULE](#)

Share

Type email: [+Add more](#)

[SHARE](#)

Figure B-5: Schedule a Task page

Scheduled Tasks: Displays all user-scheduled tasks in a structured table format, including task name, machine, date, and estimated completion time. Features options like sharing tasks with team members and marking them as completed.

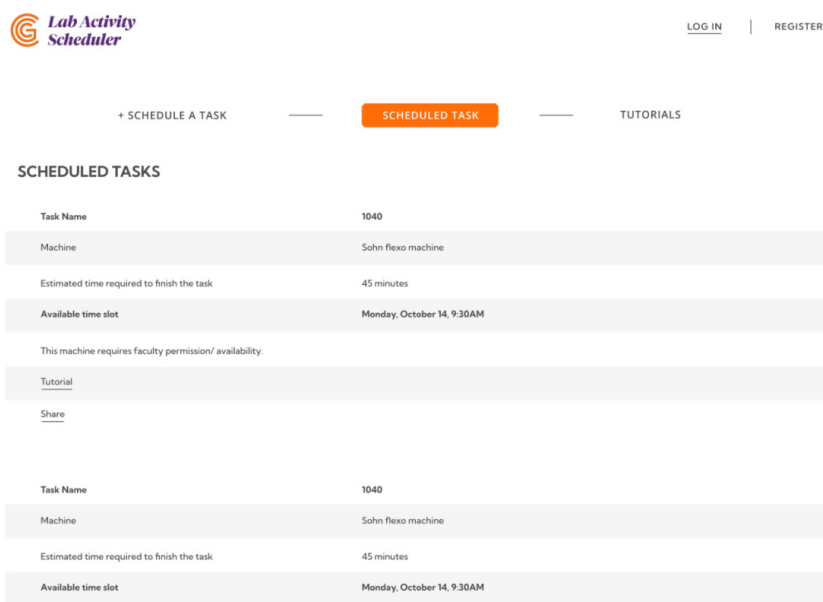


Figure B-6: Scheduled Tasks page

Tutorials: Provides task-specific instructional content, such as "How to Mount a Plate," designed to guide users through lab activities. The search bar enhances usability by allowing users to quickly find relevant tutorials.

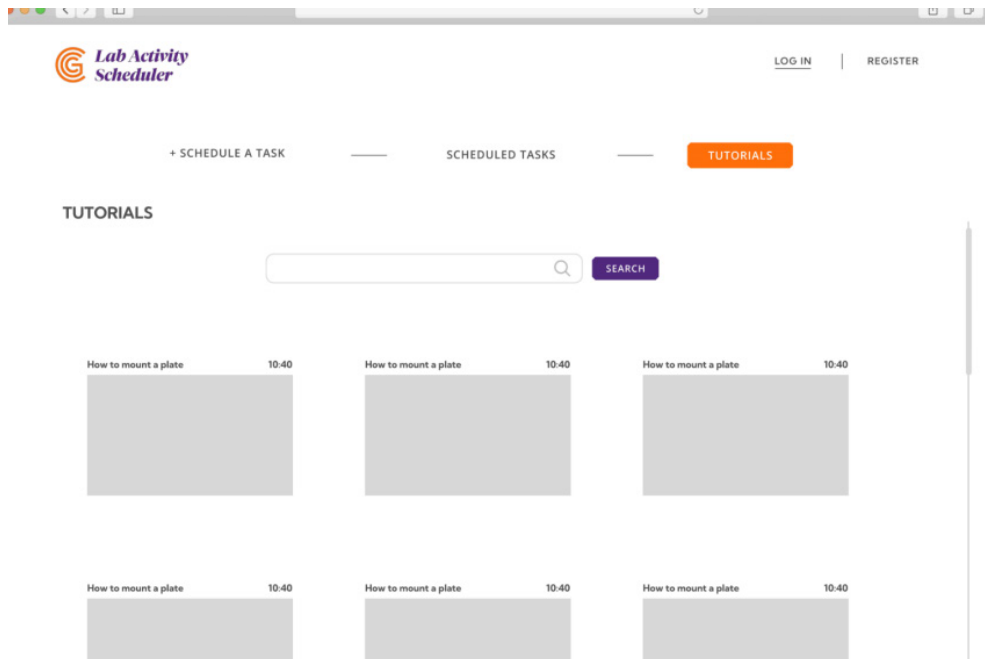


Figure B-7: Tutorials page

User-Centric Design Principles

- **Consistency:** All pages follow a uniform color palette (Clemson's orange and purple), typography (Kumbh Sans and Tiempos Headline), and button styles to maintain brand identity and visual harmony.
- **Accessibility:** High-contrast elements and clear navigation paths ensure the tool is user-friendly for individuals with varying levels of technical expertise.
- **Responsiveness:** The design supports multiple screen sizes, ensuring usability on desktops and mobile devices.

Reflection on Prototype Development

Creating the prototype on Figma allowed for rapid iteration and testing, ensuring the design met user expectations. The process highlighted the importance of visual hierarchy, logical workflows, and integrating user feedback into the design. The tool's interactive nature

allowed for demonstration and testing of key features like scheduling and tutorials, forming a strong foundation for further development.

Chapter Five

Refinement and Design Iteration

Preliminary Testing

After completing the initial prototype in Figma, the tool underwent initial testing locally among friends and family. This informal testing phase aimed to identify usability issues, gather feedback on the interface design, and observe how users interacted with the tool. While not representative of the target audience, this phase provided valuable insights into potential workflow roadblocks, unnecessary features, and areas for improvement.

Improvement

The initial testing phase revealed roadblocks in the user workflow, particularly around the complexity of navigating certain features. To address this, unnecessary options were eliminated to create a more intuitive and streamlined interface. One significant addition during this phase was the inclusion of a “Remove Account” option, providing users with greater control over their data and account management.

Discovery

During local testing, the absence of a centralized administrative tool became evident. The need for an Admin Dashboard was identified as a critical feature to simplify database management and improve system efficiency. This dashboard would allow administrators to manage user accounts, approve scheduling requests, and oversee machine usage, ensuring smooth operations and reducing manual interventions.

Outcome

Based on user feedback, the design and features of the tool were adjusted to enhance functionality and address pain points. The interface became more user-friendly, workflows were streamlined, and the groundwork was laid for the development of advanced administrative tools. These changes significantly improved the tool's usability and readiness for further development and deployment.

By involving users directly in the testing and refinement process, I was able to create a tool that not only meets the functional needs of Clemson GC students but is also optimized for ease of use, reflecting the department's branding and accessibility standards. This iterative approach underscored the importance of adapting the design based on real-world insights, resulting in a user-centered, effective scheduling solution.

Chapter Six

Key Takeaways

The following key takeaways highlight the effectiveness of a user-centered and iterative design approach in developing the Clemson GC Lab Scheduling Tool.

User-Centered Design Enhances Usability

By conducting user testing early in the design process, valuable insights were gained into how students interact with the scheduling tool. Observing users in real-time allowed for the identification and resolution of usability issues prior to development. This approach contributed to a final design that was intuitive and user-friendly, reflecting the specific needs of Clemson GC students.

Iterative Refinement Aligns the Design with User Needs

Employing an iterative approach to refine the prototype based on direct user feedback ensured that each successive version better met the functional and accessibility requirements of the users. This process allowed for continuous improvement and adaptation, resulting in a tool that closely aligns with student expectations.

The Need for Prototyping Prior to Coding

Developing a comprehensive prototype and validating it through user testing before coding reduced the likelihood of needing significant adjustments during the development phase. This method streamlined the transition from design to development, saving time and minimizing the complexity of the coding process.

Incorporating University Branding Reinforces Familiarity and Trust

Research into Clemson GC's branding guidelines allowed for the integration of consistent visual elements, such as colors and typography, that reinforce Clemson's identity. This alignment with the university's branding creates a sense of familiarity and trust, facilitating easier adoption of the tool by students.

Centralized Access Supports Student Adoption and Engagement

Publishing the tool on ClemsonGC's main website provided a centralized access point, making it more accessible to students and promoting consistent usage. By consolidating lab scheduling resources in one place, the tool offers a cohesive and practical solution for students seeking to manage lab time effectively. These takeaways underscore the importance of a user-centered, iterative design approach, particularly for

a specialized tool intended to meet the unique functional and branding requirements of the Clemson GC community.

Chapter Seven

Pre-Development

The pre-development phase of the Lab Activity Scheduler involved strategic decisions regarding hosting, database selection, and security implementation to ensure a robust and scalable platform.

Hosting

The platform is hosted on Vercel, providing a reliable and efficient hosting environment. A redirect from `clemsongc` to the lab-scheduler page was set up to integrate the tool seamlessly with Clemson University's online resources.

Database

MongoDB was chosen as the database solution for its compatibility with admin integration and user privilege management. Its flexibility and scalability make it ideal for handling user data and scheduling information efficiently.

Security

To enhance user account protection, the system implements a passkey-based authentication mechanism coupled with a one-time password (OTP) system for secure registration. These measures ensure data safety and build trust among users.

Chapter Eight

Conclusion

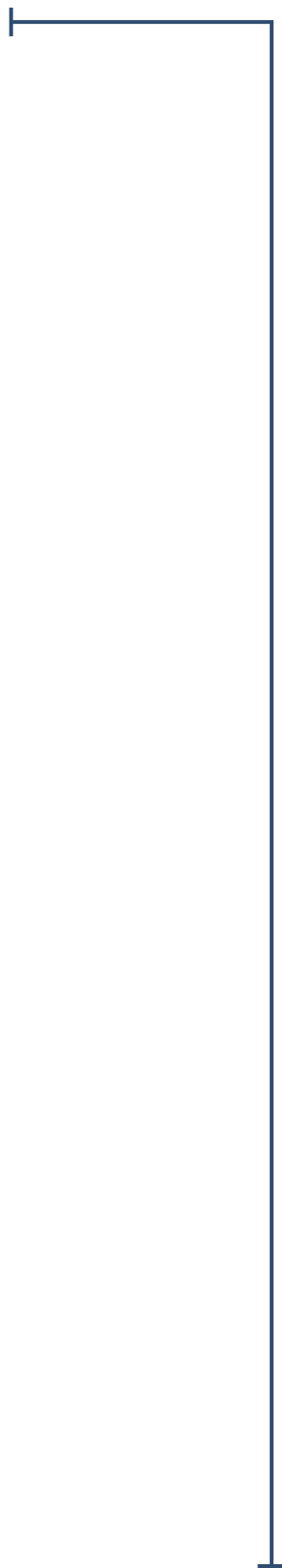
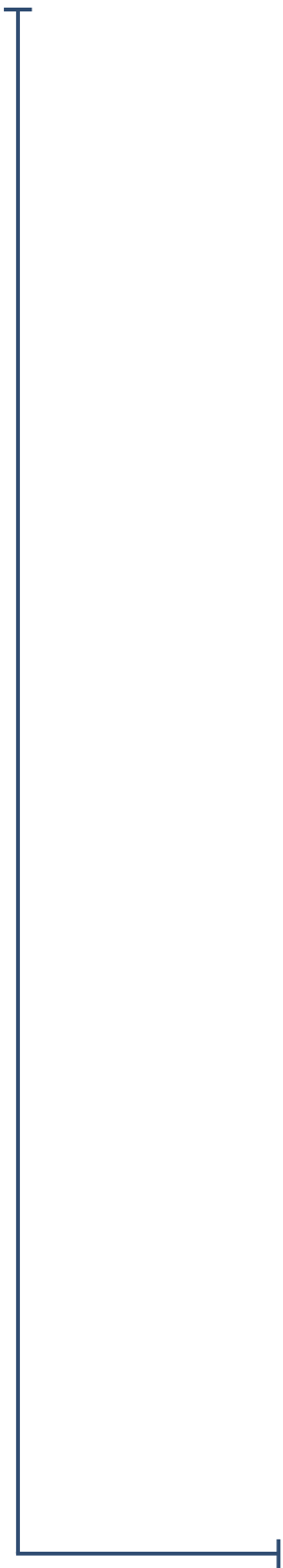
This report outlined the user-centered design process and interface development for the Clemson GC Lab Scheduling Tool, covering key stages from initial research and prototyping through user testing and iterative refinement. Through close alignment with Clemson GC's branding and consistent incorporation of user feedback, the interface was crafted to meet the specific needs of GC students, offering a familiar, accessible platform for scheduling lab resources efficiently.

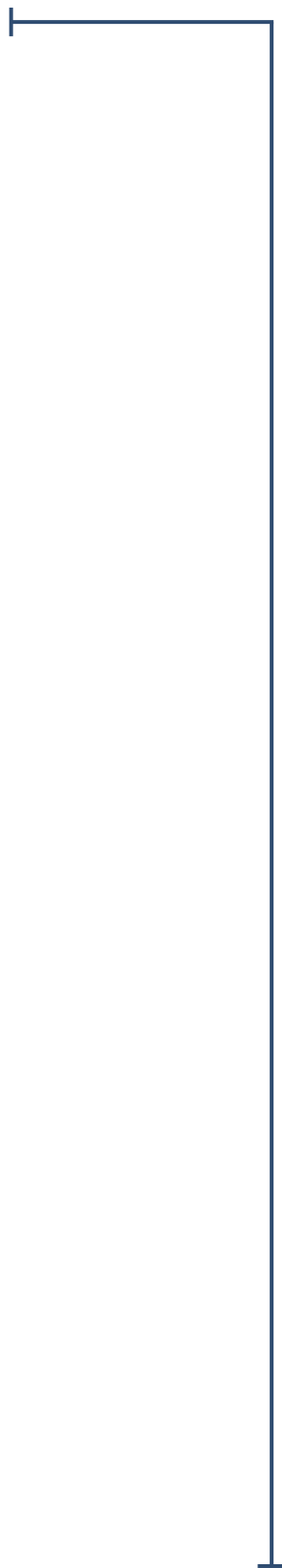
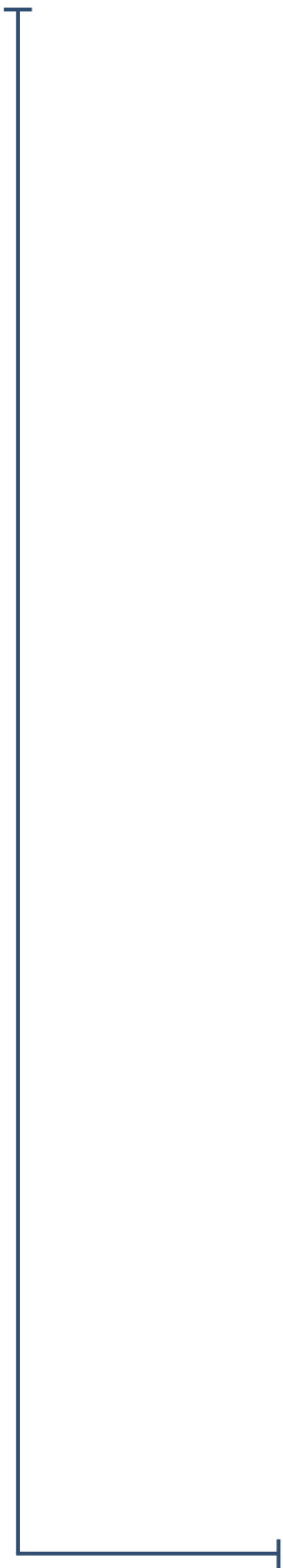
The insights gained from this initial design phase have established a solid foundation for the tool. By validating usability and functionality at the prototyping stage, the project is well-positioned for the next phase: back-end development and implementation. Part II of this report will delve into the technical development process, focusing on coding the core functionalities using the MERN stack, integrating data storage and retrieval for scheduling, implementing faculty approval workflows, and finalizing all backend components necessary for a robust, scalable solution.

Together, Parts I and II will provide a comprehensive view of the Clemson GC Lab Scheduling Tool's development, from design to deployment, ensuring it is both user-friendly and functionally powerful, meeting the needs of Clemson GC students and faculty alike.

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A Study on the Student
Experience in Graphic
Communications 1040/1
Summer Accelerated Course

Chapter

4



A Study on Student Experience in Graphic Communications 1040/1 Summer Accelerated Course

By Wren Dudley

Abstract

The Department of Graphic Communications at Clemson University offered a 10-day accelerated summer course for students enrolled in Graphic Communications I. This study involved a small sample size, with only four students enrolled in the course, limiting the distribution of data. To evaluate its effectiveness and help determine whether the course should be offered in the future, the researcher asked students to complete a course experience survey. Based on student feedback and survey results, the researcher concluded that the department should continue offering this course. Students identified the flexible class schedule and small class size as key factors contributing to the course's success. Additionally, the accelerated format enabled non-traditional students to catch up on credit hours, helping them stay on track for graduation and enhancing the value of the department's summer course offerings.

Introduction

This study involves students who were enrolled in Graphic Communications I (GC 1040/1) at Clemson University during the summer of 2024. The study aimed to evaluate whether the Graphic Communications Department at Clemson University should continue offering the accelerated GC 1040/1 summer course in future semesters, focusing on assessing retention of student information and overall course satisfaction. The department and researcher set out to answer the question: How do the instructional methods, resources, intensity, and duration of the GC 1040/1 accelerated course impact student outcomes and overall success and satisfaction in the course? This course is titled Graphic Communications 1 (GC 1040/1), featuring both lecture and laboratory components. An overview of the class states that it "Emphasizes basic graphic arts industry concepts, principles, and practices, with laboratory applications in graphic design, digital layout, image capture/manipulation, offset lithography, screen printing, flexography, digital printing, variable data, finishing operations, and color management. Also covers gravure, letterpress, and specialty printing processes, along with environmental, health, and safety concerns." (Student Registration, n.d.). This course was an accelerated summer course, where students had ten class days to complete the material. Five students initially enrolled in the course, but one withdrew during the semester, which further limited the amount of data available for interpretation. After students completed the course, the researcher sent a survey to the enrolled students to gather feedback about the course. To enhance the course experience, the Clemson University Graphic Communications Department wanted to gather information to help determine whether to offer the course again in future semesters. The department also wanted to determine whether this class format would benefit upper-level courses, given that students are required to

complete two internships during the programs' duration. The researcher administered a post-class survey via Qualtrics. This survey was designed to eliminate any identifying information, allowing students to express their opinions of the course openly and anonymously.

Literature Review

The researcher found limited current research on condensed course formats. For the purpose of this study, several terms are used to describe accelerated courses, such as mini-mester and intensive courses. These terms refer to courses that are shorter than the traditional sixteen-week semester. The world of the traditional semester-length courses is slowly fading away (Wlodkowski & Westover, 1999). There is also limited direct information about course length in the context to Graphic Communications.

Accelerated Courses

Outside influences push students to graduate progressively faster and they feel a sense of accomplishment when they complete things on time. Students are becoming increasingly convinced to enroll in accelerated courses to complete their program faster. A key question pertaining to accelerated courses is whether students learn as well as they do in regular semester-length courses (Wlodkowski & Westover, 1999). A study from Regis University compared 16-week term to short-term (five to eight weeks) formats to determine which met educational needs of students best (Wlodkowski & Westover, 1999). The study found that students met their educational needs regardless of whether they were enrolled in the traditional 16-week or five-week courses. Students responded to an end-

of-course survey, concluded that there was a high satisfaction rate among those who completed the accelerated course. An important point to note is that the enrollment age for the accelerated course tended to be older than that of the traditional-length course. The students enrolled in the GC 1040/1 accelerated course at Clemson University are predominantly in their early twenties, with few eighteen- and nineteen-year-old students. The study from Regis University sampled a larger number of students (132) than the number of students enrolled in the GC 1040/1 course at Clemson University. The most important consideration is the age difference between Regis' study and the ages of the GC 1040/1 course.

In contrast, the students in the Regis study had an average of 15 years or more work experience. Because these students were older, the study concluded that, due to their age and work experience, they were more self-directed in completing their courses in a shorter time (Wlodkowski & Westover, 1999). The students at Clemson University enroll in their first 2 years of school with little to no work experience in the Graphic Communications industry. Students enrolled in GC 1040/1 are motivated to complete this course because it is a prerequisite for higher-level courses while students also consider the factor of graduating within the traditional four-year period. A significant motivational factor for students is that these internships require two semesters of coursework away from school, potentially extending students' graduation deadlines beyond the standard four academic years.

Accelerated Learning

Accelerated learning programs have increased popularity in recent academic years. Students are more eager to complete their program by a particular time or have additional requirements that obligate students to take summer or accelerated courses, such as the Graphic Communications program at Clemson University. Wlodkowski (2003) studied the change that sparked this increase in accelerated classes, stating that most programs served adult students. There has been an increase in adults enrolling in accelerated programs to enhance their career knowledge, with most of them working full-time throughout their program (Wlodkowski, 2003). While Clemson students are not yet working professionals, the program requires students to complete two full-time internships, in which students pause enrollment in full-time coursework for two semesters. These internships allow students to gain real-world experience within the Graphic Communications industry. While on their internship, some students enroll in one or two courses to allow them to catch up on the credit hours lost while on internship. When comparing time in the classroom to learning achievements, researchers have found no clear correlation between the two, stating that "time is a necessary, but not sufficient condition, for learning" (Walberg, 1988). The most significant factors to consider in accelerated programs are "student capability, quality of instruction, and personal motivation." (Wlodkowski, 1999) Clemson students enrolled in summer courses or 'mini-semester' courses are personally motivated to complete their courses to ensure that they graduate on time. Student Cs' motivation reflects this motivation: "This course made me get ahead and now I am a sophomore with a junior standing." This is especially true for the students taking courses while on an internship. Accelerated learning programs tend to focus on

business curriculums. Research is lacking in other program areas, such as the natural sciences and engineering (Wlodkowski, 1999). While the business curriculum is part of the Graphic Communications curriculum at Clemson University, a gap remains in research that is directly tied to Graphic Communications specific accelerated programs.

Mini-mester Courses

Research involving 'mini-mester' courses is limited, while partial summer courses are more popular in higher education. However, full-semester and mini-semester courses have nearly the same "contact hours"; students are expected to learn the same amount of material as that in full-term courses (Williamson, 2017). While teachers may adapt course modules and laboratory time to better fit the summer schedule, students still complete the same projects within the shortened course duration. Williamson (2017) studied students enrolled in a 10-day mini-mester program of construction science students. Williamson's (2017) study found that students in this mini-mester course performed better on laboratory activities, quizzes, and total course grades than those enrolled in the 15-week full-term course (Williamson, 2017). Williamson additionally found that students enrolled in the 15-week course achieved higher scores on course exams than the mini-mester students (Williamson, 2017). Based on these findings, students in mini-mester courses tend to spend more time on laboratory and quiz assignments due to the nature of the accelerated courses. In mini-mester courses, students were more likely to focus more on hands-on learning and less on exam preparation due to the limited time in between classes. In Williamson's (2017) study, each class day equated to approximately two weeks of course content, with one "makeup" laboratory day. Similarly, students enrolled in GC 1040/1 complete multiple lab

activities each day, covering approximately two weeks of content per day. As stated, Williamson's (2017) summer mini-mester students scored higher on laboratory assignments than full-term students. While Williamson's (2017) summer mini-mester students scored fewer points in course exams, there is a correlation between students' hands-on motivation versus motivation after class to study for exam periods. Students interacted with laboratory material all day with little to no time to study for exam content, thus allowing for better retention of laboratory material. Similarly, GC 1040/1 students focused more closely on laboratory material than lecture content because the course dedicated a greater amount of time to lab work. The most significant gap between this research study and the GC 1040/1 study is the age of students completing the course. For Williamson's (2017) study, students were upperclassmen enrolled in their junior year of college. The students in GC 1040/1 are first- or second-year students enrolled in one of the first Graphic Communications classes.

Intensive Courses

Many universities offer multiple course lengths that students can choose from, including condensed or time-shortened semesters (Austin & Gustafson, 2006). Universities are trying to increase enrollment numbers during the summer; different course lengths have been created to improve those numbers. Austin and Gustafson (2006) conducted a study to compare the impact of course length on student learning. Austin and Gustafson (2006) found that in most research studies, researchers use the entire summer GPA to calculate how students performed rather than using GPA statistics from each summer session. Another area to consider are gaps within data, such as students enrolled in multiple courses over the summer. These students' cumulative GPAs could be negatively

affected due to the heavy courseload multiple classes create (Austin & Gustafson, 2006). Many Graphic Communications students take multiple courses over the summer to make up for courses lost during internships; these students lose fifteen to eighteen credit hours during their internship semester. A key consideration in this research is the total number of credit hours students enroll in during the entire summer, session one and two combined. Austin and Gustafson's (2006) study concluded that there is a "significant improvement from taking shortened courses that cannot be explained by student characteristics" (Austin & Gustafson, 2006).

Additionally, a similar study involving intensive courses was published in BMC Medical Education. This study examined online graduate programs in health professional education, comparing traditional 15-week course formats to intensive 7-week course formats, and focusing on student outcomes such as final grades and course evaluation ratings (Harwood et al., 2018). Harwood et al. (2018) concluded that the 15-week format allowed students to enroll in two or more courses, creating greater "flexibility in course sequencing" (Harwood et al., 2018). The study also confirmed previous findings that "no significant difference in study success was found between ICs (intensive courses) and semester long course[s]" (Harwood et al., 2018).

Another important point to note is that Austin and Gustafson (2006) agreed with Scott's (2003) conclusion that "classroom relationships and classroom atmosphere are two important factors that explain why performance is better in intensive courses" (Scott, 2003). Scott (2003) explains that students and instructors form a stronger bond when they are immersed in each other's daily lives rather than meeting only two to three times a week. Graphic Communications 1040/1 students have a higher benefit than Austin and Gustafson's (2006) students, as the GC 1040/1 course was composed of four students, compared to the higher enrollment numbers at the University of West Georgia. Scott's (1994) study follows the same implications of the GC 1040/1 summer course

study, where Scott compared the same course offered as an intensive and semester-length course (Scott, 2003). Students in this study stated that having mixed teaching methods helped increase classroom motivation and focus (Scott, 2003). Similarly, the GC 1040/1 course included both laboratory and lecture time; in some cases, instructors required students to complete lab instruction using various methods. Because GC 1040/1 includes both laboratory and lecture components, the instructor incorporated a mixed teaching approach into the curriculum to create an engaging learning environment. Instructors traditionally teach students during the lecture component and use various instructional methods during the lab component. Again, this supports Scott's (2003) research on using mixed methods teaching strategies to increase students' performance in the course. Scott (2003) concluded that intensive courses are beneficial when attributes such as "focused learning, comfortable classroom relationships, memorable experiences, in-depth discussion, less procrastination, stronger academic performances" are present (Scott, 2003). While these attributes are absent, students found summer courses "tedious, painful experiences" (Scott, 2003). Researchers can apply these attributes to the GC 1040/1 accelerated course by taking a more in-depth look at the class environment and individual student characteristics.

Course Length & Student Outcomes

The relationship between course length and student outcomes can be seen through a recent study from the Society For the Teaching of Psychology. Carman and Bartsch (2017) led a study evaluating this relationship between course length, 15-week vs 8-week, and overall student outcomes. The study evaluated graduate level students enrolled in a statistics course at a mid-sized university (Carman & Bartsch, 2017). Carmen and Bartsch (2017) used variables such as exam grades and

student course evaluations to determine the courses success. The instructor for both course lengths, taught the 8-week course in the same manner of that taught in the traditional length course. The instructor for GC 1040/1 taught the summer accelerated course in the same manner of the traditional length course, only changing the number of lectures delivered each day. Carman and Bartsch (2017) found better “student performance and higher student satisfaction with the instructor” within the 8-week course format. Similarly, students in the GC 1040/1 summer accelerated course reported high satisfaction with the instructor of record, Student D stated that “she made it extremely clear what we had to accomplish and she communicated clearly.” A difference to notice is the gap in level of academic degrees between Carman and Bartsch’s (2017) and the GC 1040/1 students. Graduate students may have different motivational factors compared to the underclassmen of GC 1040/1. The study concluded that the 8-week course students performed better on course exams and reported high satisfaction with the instructor through course evaluations, deeming the condensed course format successful (Carman & Bartsch, 2017). The researchers stated several limitations that also pertain to the GC 1040/1 course. These limitations were outside-of-class distractions, student performance leading to long-term retention of knowledge, and the study focusing on one instructor (Carmen & Bartsch, 2017).

Graphic Communications - Overview

The Graphic Communications industry is rich in new technologies and evolving print and communication techniques. To understand the content of GC 1040/1, one must first understand what Graphic Communications is and all that it encompasses. Each person has their own definition of Graphic Communications, but in the end, it is all

about print. The Graphic Communications industry encompasses a wide range of facets, including commercial print, digital print, flexography, magazines, newspapers, tag and labels, and many more areas (PGSF 2021). With a broader overview of the industry, Smith (2014) defines the Graphic Communications industry as "an industry in which visual imaging is used to convey messages," with a focus on "the production and delivery of graphic products and messages" (Smith, 2014). There is a significant shift in the industry to Artificial intelligence (AI) and automation within every workflow. This major push has companies incorporating AI into every step of print production, from graphic design to AI-integrated finishing equipment. Based on the latest industry trends, the Graphic Communications industry has expanded to encompass creative design, e-commerce, web design, mailing, and fulfillment (PGSF, 2021).

Students in the GC 1040/1 course are learning two of the most widely used print processes in the industry: screen printing and flexography. Today, printers predominantly use screen printing for apparel printing. Flexography is a significant market segment within flexible packaging, encompassing applications such as tags and labels, folding cartons, and corrugated printing (Dupont, n.d.). Students are guided through each print process and then asked to complete a press run by the end of the semester.

Methods

Research Method

This mixed-methods study evaluates whether the Graphic Communications department should continue offering the accelerated GC 1040/1 summer course in future semesters, with a focus on assessing student information retention and overall course satisfaction. To protect

student privacy and information, all names were redacted from this study and assigned a letter to signify each student (Student A, Student B, Student C, and Student D). Researchers believe that qualitative survey research captures the complexities of human experiences, providing in-depth insights that quantitative research may overlook (Jansen, 2010). Jansen (2010) states that qualitative survey research is essential in "establishing meaningful variation within the population" (Jansen, 2010). Qualitative survey research methods allow students to establish relevant dimensions and values within their survey responses (Jansen, 2010). Because this study employs a mixed-methods research approach, it enables students to share their unique perspectives on the course rather than reporting grade distributions. The researcher decided that an online survey would be the most effective research method, compared to small group interviews and grade distribution data. The researcher believed that bias could arise through small group interviews, and the results could become skewed. Online mixed-method surveys enable students to take the survey at any time and from any location, allowing them to complete it in a comfortable environment.

Survey Design & Creation

The Researcher used the software Qualtrics to create the survey. The researcher asked faculty members what they would like to know about this accelerated course and received critical feedback. Based on the information provided by faculty members, the researcher developed questions to gain a deeper understanding of student experiences rather than basing the course outcome solely on grades. The researcher designed the questions to gauge student interest, performance, areas for improvement, and overall feedback on the course. The researcher sent the survey via email to the students, which included an anonymous link

for completion and informed consent documents. Individual student survey responses can be seen in the appendices.

Procedure

The researcher obtained approval through Clemson's Institutional Review Board (IRB) to complete this study because it involved human subjects. Once the researcher obtained student emails, email requests were sent to each student. Refer to Figure 1 to view the initial email sent to students. The researcher sent a follow-up email due to a lack of timely responses to ensure survey completion. Figure 2 shows the follow-up email the researcher sent. After the researcher sent the follow-up email, all four students completed the survey.



Wren Dudley <wrend@g.clemson.edu>

GC 1040 Summer 1 Course Experience Feedback - Response Needed ASAP

Wren Dudley <wrend@g.clemson.edu>

Mon, Feb 10, 2025 at 12:02 PM

Good afternoon!

My name is Wren Dudley, and I am a Graphic Communications Graduate student. I am conducting research about the GC 1050/1 summer course you were enrolled in last summer, and I am interested in your experiences as a student. The purpose of the research is to gauge whether or not the department should offer this course in the future. As of right now, the course is set to be offered this summer, so it is pertinent we gain your feedback as soon as possible.

Your participation will involve one survey that will last between ten to fifteen minutes. The department would appreciate your honest thoughts and opinions, so please take time in your responses. This research will benefit the academic community because it helps us to understand the effectiveness of this accelerated course. Data will be compiled as a whole with no individual responses tied to your name or any identifying information about you. Your answers that are taken during the survey will be stored in a secure location. You may choose not to answer any question.

With summer session coming soon, we ask that you complete the survey as soon as possible. Your responses will be used to determine whether or not GC 1050/1 will be offered this summer.

Please complete the survey here: https://clemson.ca1.qualtrics.com/jfe/form/SV_6fhpUmZ4bh57N3M

Have a great rest of your day!
Wren Dudley

Figure 1: Initial Email

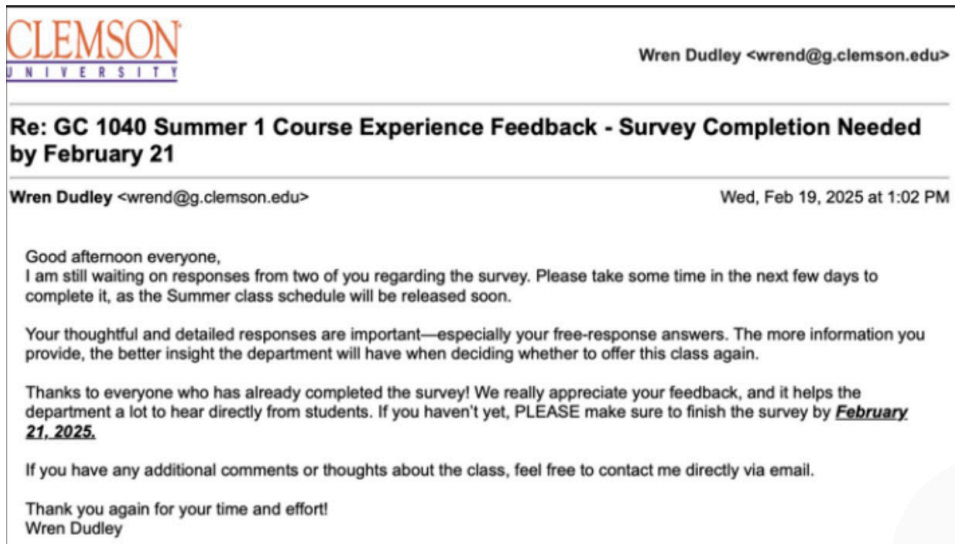


Figure 2: Follow-Up Email

Course Content

Within the Graphic Communication I course, a variety of topics relevant to industry trends are covered. While screen printing and flexography are two major print process taught, there are numerous other topics of importance. Major units of instruction taught in GC 1040/1 include history of the printing industry, graphic design, halftones/duotones, prepress, paper, finishing operations. Each of these topics are discussed in the lecture component and assessed through exams. The course includes two lecture exams, concluding with a final exam.

The first two important laboratory assignments are the Screen Printing Process Learning and Flexography Process Learning assignments. Students are taught production processes and skills used in both print processes. After completing their first press runs in screen printing and flexography, students are asked to complete optimization laboratory assignments. In these assignments, students conduct printability tests to

identify the optimal combination of production components, followed by writing a laboratory report of their findings. Students are also asked to complete a spot color laboratory assignment, which involves a prepress evaluation examining spot colors and related prepress fundamentals.

After students complete their optimization assignments, students complete a two-color press run for each print process. To finish the course, the final laboratory assignment is a choice project in which students complete a press run on their own, challenging the knowledge gained throughout the semester.

Participants

Participants in this survey were Clemson University Graphic Communications students enrolled in GC 1040/1 (Graphic Communications I) that took place in summer session one of 2024. Each of these students registered for this class during the spring semester, while they also registered for fall classes. Students who completed this summer course could enroll for GC 2070/1 during the Fall semester after the completion of the course. Graphic Communications 1040/1 is a prerequisite course for Graphic Communications II or GC 2070/1. Students must earn at least a final grade of 'D' to enroll in GC 2070/1. Typical students enrolled in GC 1040/1 are in their freshman year of college. Before students are allowed to enroll in GC 1040/1, they must complete GC 1020 (Introduction to Digital Graphics) and GC 1050 (Applications of Digital Graphics). Initially, five students registered for the class, but one dropped out within the first half of the course, leaving four students to complete it. Two students started the survey, completing the first question, but then deserted it, creating two additional 'responses' in addition to the four fully completed survey responses. The first question

will reflect these ghost responses when looking at the total number of responses reported after the stated question in each figure.

Figure 3.1 displays statistics on student survey progress, with a mean completion score of 68.67, a minimum of 6.00% and a maximum of 100.00%. Two partial (“ghost”) responses contributed to a low minimum score, resulting in a high standard deviation of 44.3, indicating a variance score of 1963.56 suggesting a wide variability in completion of the survey. Figure 1 illustrates the demographics of the GC 1040/1 students, and how they were accepted into the Graphic Communications program.

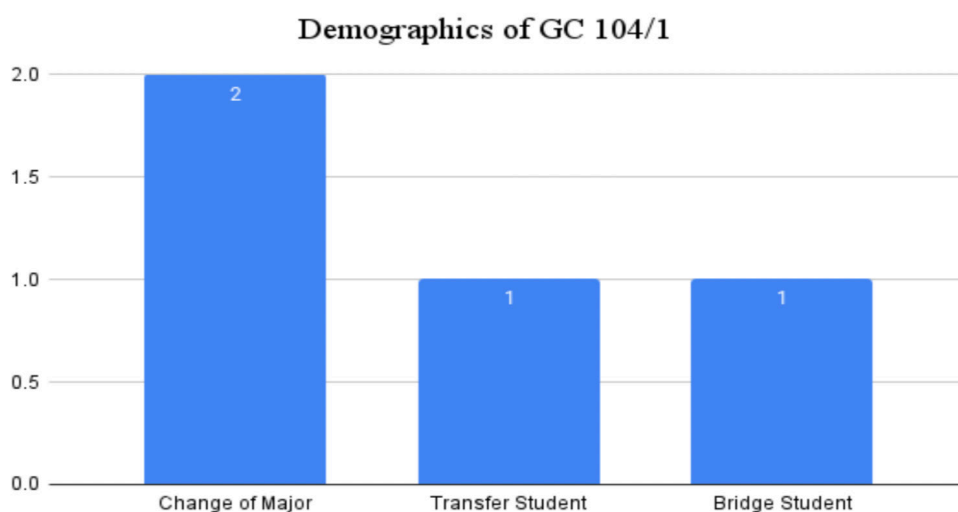


Figure 3: Demographics of GC 1040/1 Chart

Progress							
Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Progress	6.00	100.00	68.67	44.31	1963.56	6	412.00

Figure 3.1: Student Progress of Survey Statistics

Results

Survey Results & Data Analysis

QUESTION 1: How did you get accepted into the Graphic Communications Program?

The researcher asked students how they were accepted into the Graphic Communications program in the first question of the survey. There are three ways in which students can be a part of the program: original acceptance, transfer from another institution, change of major (within the University), and transfer from the Bridge to Clemson program. Students who participated in the Bridge to Clemson program complete their first year of school by taking classes at Tri-County Technical College while living on Clemson's campus. After the Bridge year is complete, Clemson accepts students who maintained a certain GPA and completed their credits during the allotted year. The Bridge to Clemson students are of Sophomore standing while enrolled in GC 1040/1, even though it is their first year as Clemson students. The class consisted of 50% change of major students, 25% Bridge students, and 25% transfer students. Two students started the survey but did not finish, answering only the first question, as stated above; these responses comprise the total number of answers to this question. The data shows that only one Bridge student was enrolled in the course, not the two responses previously misreported. Furthermore, the correct total number of change-of-major participants is two instead of the reflected three responses. Each of the following questions has the correct number of responses recorded.

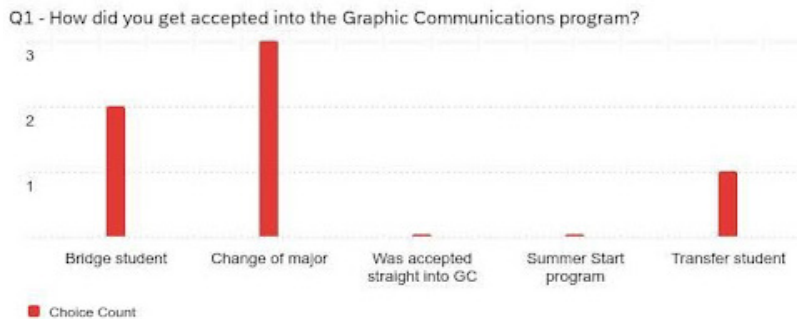


Figure 4: Question One

QUESTION 2: Do you believe you have retained a sufficient amount of information to move on to the next Graphic Communications course?

Due to the accelerated nature of Summer Courses, the researcher wanted to ask students whether they believed they had retained a sufficient amount of information from the course. To further understand the nature of summer courses and their fast-paced schedule, the researcher asked students if they felt that the shorter class time created gaps in the information being taught. During the class day, students received two lectures, one at the beginning of the day and one after lunch. Due to the increasing amount of information students were taught each day, the researcher sought to gauge students' perspectives on information retention. All students answered that they 'strongly agree' that they retained enough information to move onto GC 2070/1 successfully. Figure 5.1 shows that all four students responded with complete agreement, resulting in mean, minimum and maximum scores of 1.00. With no variation among responses, the standard deviation and variance were both 0.00, showing that all students felt they retained sufficient information to progress into the next course. There was a follow-up question asking for student input in the following question.

Q2 - Do you believe you have retained a sufficient amount of information to move onto the next Graphic Communications course?

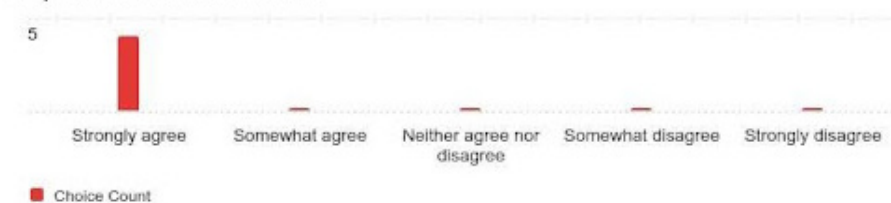


Figure 5: Question Two

Q2 - Do you believe you have retained a sufficient amount of information to move onto the next Graphic Communications course?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Do you believe you have retained a sufficient amount of information to move onto the next Graphic Communications course?	1.00	1.00	1.00	0.00	0.00	4	4.00

Figure 5.1: Question Two Statistics

COMMENTS ON QUESTION 2:

Based on question two (Do you believe you have retained a sufficient amount of information to move onto the next Graphic Communications course?) The researcher wanted student feedback on this topic. After completing GC 1040/1, students proceed to GC 2070/1, where they repeat screen printing in different applications. Due to this continuation of information, the researcher wanted to ask students if they felt comfortable moving on to the next required core class. Students A and B commented that they had no trouble with the class and kept their comments brief. Student C stated that they claimed "so much information" from GC 1040/1 and that they were "set up for success" in GC 2070/1. Student D stated that they had little to no base knowledge leading into GC 1040/1 and felt that they learned the equipment used within the course. Student D also stated that when entering GC 2070/1, they did not have any trouble with missing information that was taught

in the previous courses and built upon on GC 2027/1. The researcher posed this question because students apply their foundational knowledge of Screen Printing from GC 1040/1 into GC 2070/1 content, specifically in the context of flatbed screen printing and cylinder printing. The basic information of Screen Printing is taught in GC 1040/1 and then applied in different applications in GC 2070/1. Students who fail to learn the basics of Screen Printing will be at a disadvantage in GC 2070/1, as they will not have the foundation necessary to learn more advanced applications of screen printing in this course. Again, Student D felt that they gained a solid understanding of screen printing and flexography in GC 1040/1 and felt confident in the new applications taught in GC 2070/1.

QID18 - Comments on Question 2:

I gained so much information from this course and I have retained. It set me up for success in the next course.

none

I have had no problems in later classes.

I did not know a lot before going into the 1040 class and now I definitely know how to SP and the basics of flexo. I have attained all the knowledge I have on the processes and equipment. Moving on to 2070 I didn't run into problems with not knowing previous content.

Figure 6: Comments on Question Two

QUESTION 3: Were there any lecture topics you believe could have been explained in further detail?

The researcher asked in Question Three, Were there any lecture topics you believe could have been explained in further detail? Due to the format of the class, the researcher wanted to ask students if they felt specific lecture topics were covered in full or presented effectively. Students attend two lectures each day - one at the beginning of the day and another after the lunch break. On some days, the instructor taught two lectures consecutively to allow students to complete their lab work and then leave early for the day. All students reported that instructors explained each lecture topic thoroughly and that they grasped the material

well. Students A and B both answered with "I think I grasped everything well" and "No," giving blanket responses to this question. Student C stated that they believed all topics were "relevant and helpful when completing each project." Allowing the researcher to conclude that all lecture topics corresponded well with the lab material taught alongside enabling students to retain knowledge better due to the constant application of the material. Student D had a more in-depth comment on this question. Student D responded, "When we did whole lectures in one sitting, I definitely retained a lot of the info, and I took notes, but when you never return back to a topic after initially learning it, I think it can definitely leave you quicker. For the notes, I could look at them and share them with you. Let me know if you'd want to see them. I would probably be able to come up with some more specific topics if you want." Student D felt that they forgot lecture material 'quicker' when they did not review the information after initially learning it. Due to this accelerated class format, students had less time both in and outside of the classroom to study for exams. Student D felt that this time restriction, or lack of effort to review material, made this knowledge more difficult to retain.

Q3 - Were there any lecture topics you believe could have been explained in further detail?

I think that all of the lecture topic were relevant and helpful when completing each project.

no

I think I grasped everything well

When we did whole lectures in one sitting I definitely retained a lot of the info and I took notes but when you never return back to a topic after initially learning it, I think it can definitely leave you quicker. For the notes I could look at them and share them with you. Let me know if you'd want to see them. I would probably be able to come up with some more specific topics if you want.

Figure 7: Question Three

QUESTION 4: How satisfied were you with the class schedule?

In Question Four, the researcher asked students to rate how satisfied they were with the class schedule, using a 5-point Likert scale. Choices were 1= extremely dissatisfied, 2= somewhat dissatisfied, 3=

neither satisfied nor dissatisfied, 4= somewhat satisfied, and 5= extremely satisfied. Students B, C, and D reported being 'extremely satisfied' with the course, while Student A indicated being 'somewhat satisfied' with the course. Through Student As' answer of "somewhat satisfied", it can be concluded that they wished the class schedule was different in some aspect; they go on to explain these feelings in question eight and ten. Some factors that students may have considered when answering this question included the number of days in the course, the time of day the course was held, lecture and laboratory times, the pace of the course, and the duration of the lunch break. Figure 8.1 displays the distribution of responses with a mean score of 4.75 reflecting Student As' outlier response of "somewhat satisfied," with a range between a minimum score of 4.00 and a maximum score of 5.00. The variance of .19 and the standard deviation of .43 suggest that most students were satisfied with the course schedule. The researcher created a follow-up question asking students to comment on the course schedule in more detail in Question Five.

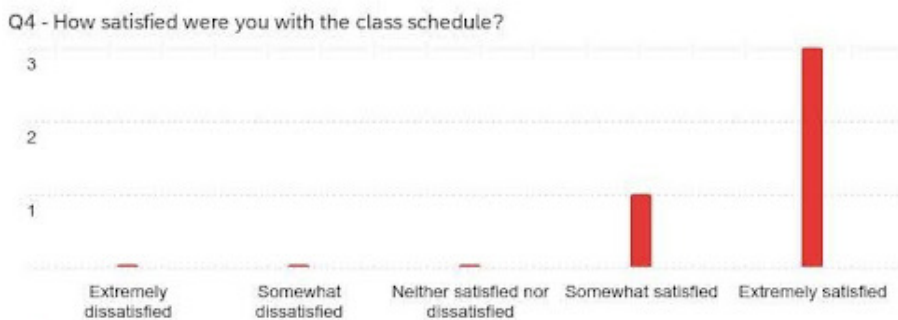


Figure 8: Question Four

Q4 - How satisfied were you with the class schedule?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
How satisfied were you with the class schedule?	4.00	5.00	4.75	0.43	0.19	4	19.00

Figure 8.1: Question Four Statistics

QUESTION 5: Would you change anything in regard to the course schedule?

The fifth question posed on the survey asked students, “Would you change anything in regard to the course schedule?”. The researcher wanted to know how the schedule should be adjusted to accommodate future semester offerings. The current instructor of record for GC 1040/1, Mrs. Marchione, wanted to know what students would change in order to prepare for future accelerated summer GC 1040/1 sections. Student A stated that they would not change anything about the course schedule by answering "probably not"; they answered question four with "extremely satisfied," which further signifies that they appreciated the course schedule. Student B answered with "a longer lunch break" in question four, indicating that they were 'extremely satisfied' with the course schedule. Students received an hour break for lunch midday after they completed the first laboratory assignment set out for that given day; Student B vocalized that they would have benefited from a more extended break to ease information overwhelm.

Q5 - Would you change anything in regards to the course schedule?

I would not change anything because it was a quick course and it was an advantage taking it. I am now ahead of normal bridge students and caught up with the course.

longer lunch break

probably not

We went at a pace where she planned everything prior to the day. We followed the schedule. We would talk as a small group if we wanted to adjust the time we left for lunch or time we stayed out for lunch, etc. We ended up being able to leave early many days. There were only a few we stayed close to 4 or 5 pm. So not anything I can suggest changing. I liked the 4 day a week.

Figure 9: Question Five

QUESTION 6: Was the course breakdown (topics, assignments, etc.) clear and well organized?

After asking students about their thoughts on the course schedule, the researcher wanted to ask about the lecture and laboratory components

of the class. Question six asked students, "Was the course breakdown (topics, assignments, etc.) clear and well organized?" Because instructors taught two lectures and two labs per school day, the researcher examined whether students understood the breakdown of the information taught. All students answered the question "very clearly." Due to the fast-paced nature of this course, the researcher wanted to discover if the accelerated format made the course confusing to follow. Based on the answers provided by the students, they believed that the course was clear and well-organized. The instructor utilized Canvas to outline lecture material and assignment descriptions, allowing students to track their course progress continuously. Canvas is an online "user-friendly learning management system designed to simplify teaching and enhance student learning" (Canvas, n.d.). The instructor utilized Canvas as a tool to help students clearly understand assignment expectations creating assignment rubrics, allowing for an organized environment for students to clearly see course expectations. Figure 10.1 displays the distribution of responses with a mean score of 1.0, with successive minimum and maximum scores of 1.00. The variance and standard deviation of 0.00, suggests all students ranked the course breakdown as "very clear."

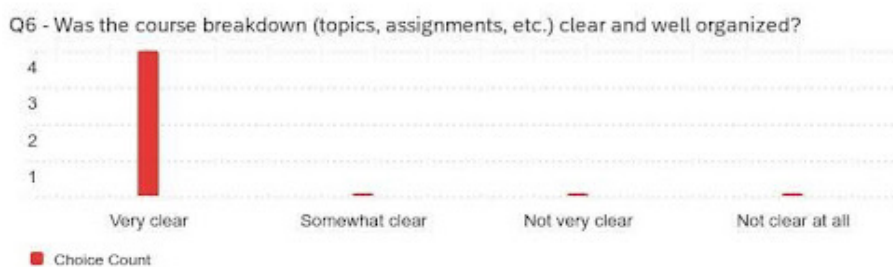


Figure 10: Question Six

Q6 - Was the course breakdown (topics, assignments, etc.) clear and well organized?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Was the course breakdown (topics, assignments, etc.) clear and well organized?	1.00	1.00	1.00	0.00	0.00	4	4.00

Figure 8.1: Question Four Statistics

QUESTION 7: What aspects of the course did you find the most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

In question seven, the researcher asked students to rank certain aspects of the course from most beneficial to least beneficial. The researcher aimed to gauge what students found most beneficial in order to make suggestions for future course offerings. The aspects of the course were: small class size, hands-on projects, fast pace schedule, course materials, lecture content, group discussion and flexible schedule. Based on the student's answers to questions one through six, the researcher sought to gain a comprehensive understanding of what students liked most about the course and what each student personally found the most and least beneficial.

Student A:

Student As' answers from most beneficial to least beneficial are to follow: small class size, hands-on projects, fast-paced schedule, course material, lecture content, group discussions, and flexible schedule. Student A ranked 'small class size' the highest out of their peers, valuing the close-knit group aspect over all other aspects. Student A was the only student who ranked 'small class size' as the most beneficial aspect in comparison to their peers.

Q7. What aspects of the course did you find most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

Small class size	1
Hands-on projects	2
Fast pace schedule	3
Course materials	4
Lecture content	5
Group discussions	6
Flexible schedule	7

Figure 11: Student A Responses to Question Seven

Student B:

Student B's answers, from most beneficial to least beneficial, are as follows: hands-on projects, group discussions, flexible schedules, small class sizes, course materials, fast-paced schedules, and lecture content. Student B valued 'hands-on projects' the most out of all aspects of the course along with Students C and D. Additionally, Student B ranked "group discussions" the highest out of their peers.

Q7. What aspects of the course did you find most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

Hands-on projects	1
Group discussions	2
Flexible schedule	3
Small class size	4
Course materials	5
Fast pace schedule	6
Lecture content	7

Figure 12: Student B Responses to Question Seven

Student C:

Student Cs' answers from most beneficial to least beneficial are as follows: Hands-on projects, small class size, fast-paced schedule, lecture content, flexible schedule, group discussion, and course materials. Both Student C and Student D valued hands-on projects and the small class size as the most beneficial aspects of the course.

Q7. What aspects of the course did you find most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

Hands-on projects	1
Small class size	2
Fast pace schedule	3
Lecture content	4
Flexible schedule	5
Group discussions	6
Course materials	7

Figure 13: Student C Responses to Question Seven

Student D:

Student D's answers, from most beneficial to least beneficial, are as follows: hands-on projects, small class size, flexible schedule, group discussions, fast-paced schedule, course materials, and lecture content. Student Ds' responses fell similarly to Student C, as they both answered that the hands-on projects and small class size aspects were the most important aspects of the course. In contrast, Student D ranked "lecture content" as the least beneficial aspect of the course, similarly to Student B.

Q7. What aspects of the course did you find most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

Hands-on projects	1
Small class size	2
Flexible schedule	3
Group discussions	4
Fast pace schedule	5
Course materials	6
Lecture content	7

Figure 14: Student D Responses to Question Seven

QUESTION 8: If you could change one thing about the course, what would that be?

The researcher then followed up and asked, "If you could change one thing about the course, what would it be?" Student A responded with "a slightly longer lunch break." Students were given roughly an hour each day for a lunch break after the first half of the day was complete. The school day is very long in summer classes and even longer in accelerated summer courses; more breaks throughout the day or an extended lunch break would benefit all parties involved. Student B commented that they would change "nothing." Student B felt content with the course, feeling that they benefited from the format in which the course was given. Student C commented, "I think I would change from the 9-5 schedule because sometimes I would not be there for the whole time, but a couple times I was, it could be from 9-3." Student C felt that the set class meeting time constricted their schedule outside of school. Although some courses do not use the full scheduled time, Student C felt this course should be advertised as having a shorter class duration. While this does potentially help students, in the case that the class runs long, students would not be prepared to stay the whole duration, if not over the allotted time. While Student A wanted an extended lunch break, while Student C wanted a shorter day. The researcher believes that both students felt the long school

day affected them, in contrasting aspects. An option to address these issues would be to hold online lectures where students guide themselves through lecture material then come into class to discuss the topic of the day. Finally, Student D commented, "I guess that it would not hurt to be a longer than only 10 day course. Like 15 and there could just be that much more time to go a little deeper and to still have a buffer." Student D states that a longer class duration would be beneficial in their eyes, in contrast Student B felt that 10 days was enough time, even though shorter class days would be beneficial in their opinion.

Q8 - If you could change one thing about the course, what would that be?

I think I would change from the 9-5 schedule because sometimes I would not be there for the whole time, but a couple times I was. It could be from 9-3.

nothing

a slightly longer lunch period

I guess that it would not hurt to be a longer than only 10 day course. Like 15 and there could just be that much more time to go a little deeper and to still have buffer.

Figure 15: Question Eight

QUESTION 9: What would you suggest to improve the course content or structure?

To go more in-depth into course structure and content, the researcher asked, "What would you suggest to improve the course content or structure?". Student A and Student B both responded with "nothing." Based on these answers, Students A and B felt that, in terms of content and structure, the course was beneficial as it was given. Student C responded, "I would maybe not rely on all of the historical knowledge because it didn't seem relevant to what we were doing." While this student felt the historical knowledge of the print industry was irrelevant, this information gives critical context to many modern print techniques currently still in use. While this student does not believe in learning the history behind

print, more advanced classes teach the context as to why modern print technologies relate to the first print techniques used. Student D responded, "The only thing I can think of is the multiple lectures and just word vomit that the slides would sometimes be. There is probably many more ways to teach the info from the lectures or discuss them." Student D mentioned 'word vomit' on the lecture slides, this is when there is far too much information on all slides that lead to students missing vital information being taught. Students focus on writing down all information presented on the slides, rather than highlighting key information the instructor wants them to focus on. The researcher recommends the instructor organize course material consistently to help students understand key information presented on each slide. Student D also mentioned 'multiple lectures.' While the instructor must deliver all lecture content of the full-term course, the researcher believes restructuring the material on lecture slides may help reduce student information overload.

Q9 - What would you suggest to improve the course content or structure?

I would maybe not rely on all of the historical knowledge because it didn't seem relevant to what we were doing

nothing

nothing

The only thing I can think of is the multiple lectures and just word vomit that the slides would sometimes be. There is probably many more ways to teach the info from the lectures or discuss them.

Figure 16: Question Nine

QUESTION 10: How likely are you to recommend this summer course to a peer?

The researcher asked, "How likely are you to recommend this summer course to a peer?". Three students responded with "extremely likely", while one student, Student A responded, "somewhat likely." Throughout the survey, Student A was brief in their responses. Students B, C, and D responded with "extremely likely", these students tended to

provide more detailed descriptions in their response's comparative to Student A. The researcher believes that Student A, a change of major student, hesitated to recommend this course fully due to their brief comments in numerous free response questions. Student A responded that they were "somewhat satisfied" with the course schedule and would consider changing to a "slightly longer lunch period" to improve the overall course effectiveness. Student A was the only respondent who reported being "somewhat satisfied" in regards to course schedule that was posed in question four. The researcher believes that based on Student As' short answers and their impact on course satisfaction, Student A answered question ten with 'somewhat likely.' Based on Students B, C, and D's responses to questions four and ten, they would recommend this course to future peers.

Figure 17.1 displays the distribution of responses with a mean score of 1.25 reflecting Student As' outlier response of "somewhat likely", with a range between a minimum score of 1.00 and a maximum score of 2.00. The variance of .19 and the standard deviation sat at .43, suggests that most students would recommend this course to their peers.

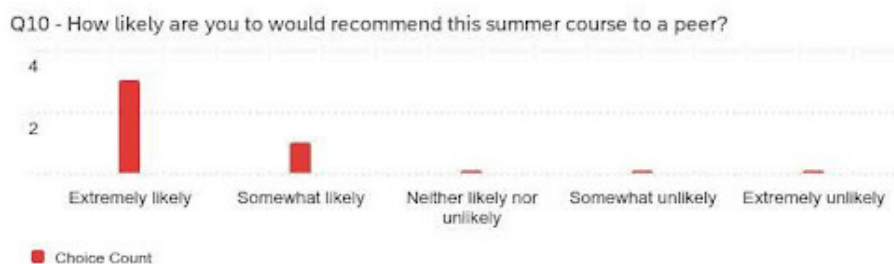


Figure 17: Question Ten

Q10 - How likely are you to would recommend this summer course to a peer?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
How likely are you to would recommend this summer course to a peer?	1.00	2.00	1.25	0.43	0.19	4	5.00

Figure 17.1: Question Ten Statistics

QUESTION 11: Are you satisfied with the grade you received for this course?

In question eleven, the researcher asked, "Are you satisfied with the grade you received for the course?". All students responded that they were satisfied with the grade they received in GC 1040/1. The researcher did not have access to grade data to assess academic achievement, but based on individual responses, students were generally satisfied with the grades they received in the course. Figure 18.1 displays the distribution of responses with a mean score of 1.0, with successive minimum and maximum scores of 1.00. The variance and standard deviation of 0.00, suggests all students were satisfied with the grade they received for this course.

Q11 - Are you satisfied with the grade you received for this course?



Figure 18: Question Eleven

Q11 - Are you satisfied with the grade you received for this course?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Are you satisfied with the grade you received for this course?	1.00	1.00	1.00	0.00	0.00	4	4.00

Figure 18.1: Question Eleven Statistics

QUESTION 12: Comments on Question 11:

Since grade data was not collected, the researcher wanted to collect comments based on question ten. The researcher wanted to know students' thoughts on whether they received a satisfactory grade in the course. Student A responded, "I did well," and Student B responded "none", both providing a straight to the point answers. While Student C responded, "I received an A and was extremely satisfied." The researcher clarified that this study did not report final grade data, Student C felt that it was important to state the grade they received to answer the question entirely. Finally, Student D responded, "I don't know specifically, but I know I finished with an A in it. I also learned so much without a dent on my summer." Student D highlighted that they felt they learned sufficient information while still having most of their summer left after the course was complete. Students C and D both self-reported their grades. Based on this information reported, the researcher knows that at least 50% of the students received an A in the course.

Q12 - Comments on Question 11:

I received an A and was extremely satisfied.

none

I did well

I don't know specifically but I know I finished with an A in it. I also learned so much without a dent on my summer.

Figure 19: Question Twelve Comments on Question 11

QUESTION 13: Do you feel that your academic performance was decreased due to the nature of the accelerated course?

The researcher then wanted to follow up on academic performance by asking students, "Do you feel that your academic performance was affected by the nature of the accelerated course?" Students A, C, and D responded, "strongly disagree," while Student B responded, "somewhat disagree". Student B's response of "somewhat disagree" differs from the rest of their responses throughout the survey, Student B gave brief comments and answered positively throughout the rest of the survey giving little insight as to why they felt their academic performance was diminished, by any amount, due to the accelerated course format. Student B left comments about "a longer lunch break" and commented "none" on other questions, with brief discussion limiting clarity on their personal opinions of the course.

Figure 20.1 displays the distribution of responses with a mean score of 15.25 reflecting Student Bs' outlier response of "somewhat disagree", with a range between a minimum score of 15.00 and a maximum score of 16.00. The variance of .19 and the standard deviation sat at .43, suggests that most students felt that their academic performance was not affected due to the accelerated nature of the course.

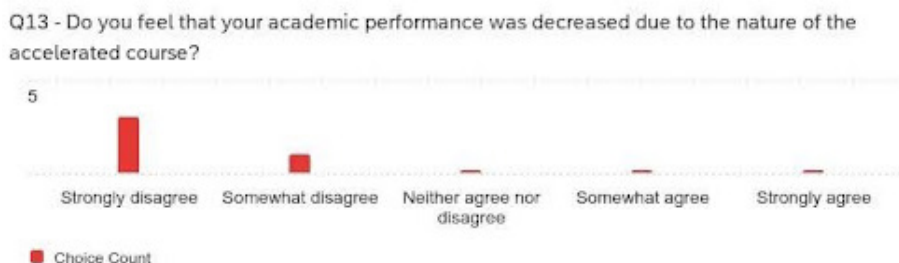


Figure 20: Question Thirteen

Q13 - Do you feel that your academic performance was decreased due to the nature of the accelerated course?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Do you feel that your academic performance was decreased due to the nature of the accelerated course?	15.00	16.00	15.25	0.43	0.19	4	61.00

Figure 19: Question Twelve Comments on Question 11

QUESTION 14: Comments on Question 13:

Based on the answers provided, the researcher wanted students to comment on question 13. Question thirteen asked if students felt their academic performance had decreased during this summer course. Student A commented that they "felt like I was able to keep up because of the smaller class size." Student A also ranked "class size" as the most beneficial aspect of the course in question seven. Student B commented "none," which follows the pattern of minimal comments on other questions throughout the survey. Student C responded, "I still gave the same effort and worked hand on each project and assignment." Student C ranked "hands-on projects" as the most beneficial aspect of the course in question seven. Student D responded, "I was very engaged still and thinking and conversing. I was not at anytime aware of a decrease in my performance I came energized and fed and ready to be hands on and participative. That's a huge part." Student D felt that preparing for class was a significant part of their performance in GC 1040/1; they felt that their performance never decreased throughout the course due to the accelerated course format.

Q14 - Comments on Question 13:

I still gave the same effort and worked hard on each project and assignment.

none

Felt like I was able to keep up because of the smaller class size

I was very engaged still and thinking and conversing. I was not at anytime aware of a decrease in my performance I came energized and fed and ready to be hands on and participative. That's a huge part.

Figure 21: Question Fourteen

QUESTION 15: Would you take another summer accelerated Graphic Communications course in the future?

Based on the survey results, the department wanted to know if these students would take other accelerated Graphic Communications courses. Question 15 asked, "Would you take another summer accelerated Graphic Communications course in the future?" All students responded "yes", answering that they would be interested in taking higher-level courses in this accelerated format. Because students are required to take two internships during the program, summer classes are offered to allow students to make up credit hours lost while away on internships. Upper-level courses offered in this accelerated format would enable more students to take additional credit hours during the summer, allowing them to graduate closer to their expected timeframe. Figure 22.1 displays the distribution of responses with a mean score of 1.0, with successive minimum and maximum scores of 1.00. The variance and standard deviation of 0.00, suggests all students would take a higher-level accelerated Graphic Communications course in the future.

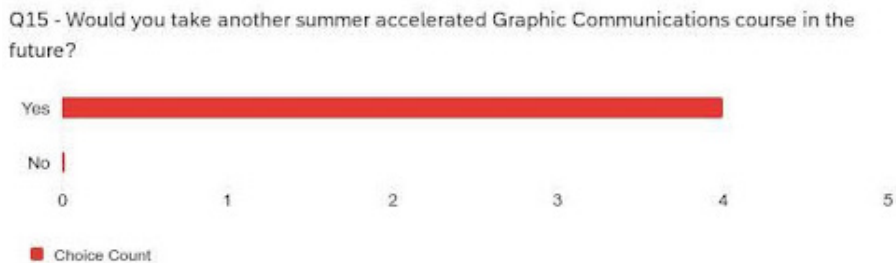


Figure 22: Question Fifteen

Q15 - Would you take another summer accelerated Graphic Communications course in the future?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Would you take another summer accelerated Graphic Communications course in the future?	1.00	1.00	1.00	0.00	0.00	4	4.00

Figure 22.1: Question Fifteen Statistics

QUESTION 16: Please share any additional comments or experiences about the summer course. Please give as much detail as you can.

Finally, the researcher encouraged students to discuss any topics not previously addressed in the survey. Question 16 asked, "Please share any additional comments or experiences about the summer course. Please give as much detail as you can." Student A responded, "I liked the format of the class." Student B responded, "none." Student C responded, "The class was well organized, but with a lot of content to learn. The small class size was the most convenient because I was able to get one on one time with the professor. The professor was amazing she was the nicest person ever and she knew exactly what she was doing. This course made me get ahead and now I am a sophomore with a junior standing." This course allowed Student C to get ahead in their coursework, as they were a Bridge Student, catching up on credit hours as a Bridge Student is rare due to students entering the program two

semesters late. Because Student C was able to take this course, they are more likely to be on track to graduate with their graduating class. Finally, Student D commented, "It welcomed a few faces I will always recognize around now. I know mrs. Great isn't with GC anymore, but I liked her and how she was experiencing this with us and being flexible. She made it extremely clear what we had to accomplish, and she communicated clearly." Student D reflected on their overall positive experience with this course, highlighting that the professor increased the course experience.

Q16 - Please share any additional comments or experiences about the summer course. Please give as much detail as you can.

The class was well organized, but with a lot of content to learn. The small class size was the most convenient because I was able to get one on one time with the professor. The professor was amazing she was the nicest person ever and she knew exactly what she was doing. This course made me get ahead and now I am a sophomore with a junior standing.

none

I liked the format of this class

It welcomed a few faces I will always recognize around now. I know mrs. Great isn't with GC anymore but I liked her and how she was experiencing this with us and being flexible. She made it extremely clear what we had to accomplish and she communicated clearly.

Figure 23: Question Sixteen

Discussion

Based on the survey results, the Graphic Communications department will have valuable insight into whether to offer summer accelerated courses in the future. Each student provided honest and critical feedback to help inform future course offerings. Based on the answers that students provided, it is clear through each survey response and comment that every student enjoyed the course and gained valuable information. Each student gave a unique course perspective while offering critical feedback into their course experience. Students suggested that the lunch break

period was far too short and that extending it would enhance the overall course experience. Students also felt that lecture slide material tended to be overwhelming, suggesting that simplifying slides to include only essential information would aid in information retention. Students appreciated the ten-day course period, as some days had less information to cover, which allowed them to leave early. One student suggested changing the meeting time to allow students to plan their time outside of class. Students valued the course's small class size and hands-on projects as the most beneficial aspects to the course, while the fast-paced schedule, group discussions, and lecture content were the least beneficial aspects of the course. Students were confident in their ability to move on to the next course, GC 2070/1, based on the knowledge gained in GC 1040/1. Students felt that their base knowledge of screen printing gained in GC 1040/1 helped better prepare them for screen printing in GC 2070/1. Students reported that the intense course format was valuable, as it allowed them to learn the course objectives laid out at the beginning of the course. This research led the researcher to conclude that the course was an overall success; each student seemed to enjoy the class while still having a memorable summer experience. Based on the findings, the researcher can give course feedback to the future professor of GC 104/1, giving information to help better prepare students for upper-level courses.

Limitations

While the GC 1040/1 accelerated course students offered informative feedback, the small class size limited the scope of research. Typical summer courses, which are 5-week courses, are capped at 16 students per class, consequently increasing the sample size for research. In these courses, professors have more time to work through lecture material and laboratory content, which limits the number of students able

to enroll. Due to the additional time constraints of this course, the cap on student enrollment was even less. Although the accelerated class is a fraction of the time, the courses four students formed a limited group from which to obtain feedback. Stronger data could be collected over time if the researcher administered student feedback surveys after each accelerated course offering. While each student's responses were well thought out and detailed, in the future, the researcher could ask more questions based on the course schedule, lecture material, and overall achievement.

Future Research

To avoid overwhelming students with too many questions, the researcher kept the survey to a reasonable length. In future studies on accelerated class formats, researchers could consider using a multi-section survey or a pre- and post-course survey to capture students' opinions in real time. A pre-and post-survey could capture students' baseline knowledge of the content taught in GC 1040/1, allowing the researcher to determine if students are entering the course with any prior knowledge of print. This base knowledge may influence overall achievement in the course, and successive courses. Instructors could track students with base knowledge throughout the Graphic Communications curriculum and compare performance to students with no previous print knowledge when entering the program. Tracking this base knowledge could help develop a new curriculum for students with print experience, allowing them to enroll in upper-level technical classes earlier in the program. Students who enrolled in Graphic Communications courses in high school have base print knowledge that could allow them to test out of some classes within the Graphic Communications program.

Future research could focus on following GC 1040/1 students into their upper-level courses to see how they perform compared to traditional length GC 1040/1 students, looking at final grade data, exam performance, and laboratory assignment performance. The research could track student grade data, while also giving students benchmark tests in each class to track their performance compared to traditional length GC 1040/1 students. Tracking these accelerated GC 1040/1 students would give a further look at whether students fully grasped the foundational knowledge taught in GC 1040/1. Additional future research could explore how students enter the program - whether through transfer admission, the Bridge to Clemson program, change of major, or direct admission into Graphic Communications.

Because this course attracted Bridge to Clemson students due to the program's nature, the researcher believes that this factor could help the department create a more effective course lineup for these students. Bridge to Clemson students enter the Graphic Communications program after two semesters at Tri-County Technical College, pushing these students back two semesters within the program. Enrolling in the accelerated summer GC 1040/1 course allows these students to catch up on the Graphic Communications course credits lost while in their Bridge year.

To gain full feedback and accurate information, the researcher believes that a holding focus group post-course with an outside moderator would create a laid-back environment where students can freely express their thoughts, aiding in the creation of better constructive feedback. Holding a focus group would allow students to answer questions without the fear of phrasing their opinions incorrectly. This environment would foster a safe environment where students would feel free to express their thoughts and concerns without external bias. The professor could hold this focus group on the last day of class to enable students to share their thoughts about the class. Furthering this research to focus on existing print knowledge, student acceptance status, and focus groups, would extend

the student experience in Graphic Communications 1040/1 summer accelerated format. Exploration of these research avenues would help the Graphic Communications Department gain a better understanding of how to create individualized plans of study that effectively meet students' needs.

Conclusion

This study aimed to determine whether the Graphic Communications Department at Clemson University should continue offering the summer accelerated GC 1040/1 course in future semesters. To gather first-hand feedback, the researcher surveyed students enrolled in the Summer 2024 session of GC 1040/1. Each student provided in-depth, critical feedback, leading the researcher to conclude that the course was a success.

Students appreciated that the accelerated course format allowed them to complete the course quickly, enabling them to enjoy the remainder of their summer outside the classroom. However, the students suggested improvements to the daily schedule, specifically increased flexibility toward the end of the day, and a longer lunch break each day. Students consistently ranked the small class size and hands-on projects as the most beneficial aspects of the course.

The consensus of the students' suggestions were to increase break times throughout the day, especially by extending the lunch break. Students provided honest opinions about the class, highlighting its strengths and areas for improvement. The feedback received through the survey played a crucial role in evaluating the course's overall effectiveness.

Completing this course puts students a semester ahead—or caught up—in their core Graphic Communications curriculum, potentially

enabling them to graduate on time or early. One student reflected positively on the experience, commenting that the course "welcomed a few new faces I will always recognize around now."

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Appendices

Student A Individual Survey Response

Q1. How did you get accepted into the Graphic Communications program?

- ☐ Bridge student
- ☒ Change of major
- ☐ Was accepted straight into GC
- ☐ Summer Start program
- ☐ Transfer student

Q2. Do you believe you have retained a sufficient amount of information to move onto the next Graphic Communications course?

- Strongly agree Somewhat agree Neither agree nor disagree Somewhat disagree Strongly disagree
- ☒ ☐ ☐ ☐ ☐

Comments on Question 2:

I have had no problems in later classes.

Q3. Were there any lecture topics you believe could have been explained in further detail?

I think I grasped everything well

Q4. How satisfied were you with the class schedule?

- Extremely dissatisfied Somewhat dissatisfied Neither satisfied nor dissatisfied Somewhat satisfied Extremely satisfied
- ☐ ☐ ☐ ☒ ☐

Q5. Would you change anything in regards to the course schedule?

probably not

Q6. Was the course breakdown (topics, assignments, etc.) clear and well organized?

Very clear Somewhat clear Not very clear Not clear at all



Q7. What aspects of the course did you find most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

Small class size

1

Hands-on projects

2

Fast pace schedule

3

Course materials

4

Lecture content

5

Group discussions

6

Flexible schedule

7

Q8. If you could change one thing about the course, what would that be?

a slightly longer lunch period

Q9. What would you suggest to improve the course content or structure?

nothing

Q10. How likely are you to would recommend this summer course to a peer?

Extremely likely

Somewhat likely

Neither likely nor unlikely

Somewhat unlikely

Extremely unlikely

Q 11. Are you satisfied with the grade you received for this course?

- ☒ Yes
☐ No

Q 12. Comments on Question 11:

I did well

Q 13. Do you feel that your academic performance was decreased due to the nature of the accelerated course?

- Strongly disagree ☒ Somewhat disagree ☐ Neither agree nor disagree ☐ Somewhat agree ☐ Strongly agree ☐

Q 14. Comments on Question 13:

Felt like I was able to keep up because of the smaller class size

Q 15. Would you take another summer accelerated Graphic Communications course in the future?

- ☒ Yes
☐ No

Q 16. Please share any additional comments or experiences about the summer course. Please give as much detail as you can.

I liked the format of this class

Student B Individual Survey Response

Q1. How did you get accepted into the Graphic Communications program?

- ☐ Bridge student
- ☐ Change of major
- ☐ Was accepted straight into GC
- ☐ Summer Start program
- ☒ Transfer student

Q2. Do you believe you have retained a sufficient amount of information to move onto the next Graphic Communications course?

- Strongly agree Somewhat agree Neither agree nor disagree Somewhat disagree Strongly disagree
- ☒ ☐ ☐ ☐ ☐

Comments on Question 2:

none

Q3. Were there any lecture topics you believe could have been explained in further detail?

no

Q4. How satisfied were you with the class schedule?

- Extremely dissatisfied Somewhat dissatisfied Neither satisfied nor dissatisfied Somewhat satisfied Extremely satisfied
- ☐ ☐ ☐ ☐ ☒

Q5. Would you change anything in regards to the course schedule?

longer lunch break

Q6. Was the course breakdown (topics, assignments, etc.) clear and well organized?

Very clear Somewhat clear Not very clear Not clear at all



Q7. What aspects of the course did you find most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

Hands-on projects	1
Group discussions	2
Flexible schedule	3
Small class size	4
Course materials	5
Fast pace schedule	6
Lecture content	7

Q8. If you could change one thing about the course, what would that be?

nothing

Q9. What would you suggest to improve the course content or structure?

nothing

Q10. How likely are you to would recommend this summer course to a peer?

Extremely likely Somewhat likely Neither likely nor unlikely Somewhat unlikely Extremely unlikely

Q 11. Are you satisfied with the grade you received for this course?

- ☒ Yes
☐ No

Q 12. Comments on Question 11:

none

Q 13. Do you feel that your academic performance was decreased due to the nature of the accelerated course?

- Strongly disagree Somewhat disagree Neither agree nor disagree Somewhat agree Strongly agree
☐ ☒ ☐ ☐ ☐

Q 14. Comments on Question 13:

none

Q 15. Would you take another summer accelerated Graphic Communications course in the future?

- ☒ Yes
☐ No

Q 16. Please share any additional comments or experiences about the summer course. Please give as much detail as you can.

none

Student C Individual Survey Response

Q1. How did you get accepted into the Graphic Communications program?

- ☒ Bridge student
- ☐ Change of major
- ☐ Was accepted straight into GC
- ☐ Summer Start program
- ☐ Transfer student

Q2. Do you believe you have retained a sufficient amount of information to move onto the next Graphic Communications course?

- Strongly agree Somewhat agree Neither agree nor disagree Somewhat disagree Strongly disagree
- ☒ ☐ ☐ ☐ ☐

. Comments on Question 2:

I gained so much information from this course and I have retained. It set me up for success in the next course.

Q3. Were there any lecture topics you believe could have been explained in further detail?

I think that all of the lecture topics were relevant and helpful when completing each project.

Q4. How satisfied were you with the class schedule?

- Extremely dissatisfied Somewhat dissatisfied Neither satisfied nor dissatisfied Somewhat satisfied Extremely satisfied
- ☐ ☐ ☐ ☐ ☒

Q5. Would you change anything in regards to the course schedule?

I would not change anything because it was a quick course and it was an advantage taking it. I am now ahead of normal bridge students and caught up with the course.

Q6. Was the course breakdown (topics, assignments, etc.) clear and well organized?

Very clear Somewhat clear Not very clear Not clear at all

☒ ☐ ☐ ☐

Q7. What aspects of the course did you find most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

Hands-on projects	1
Small class size	2
Fast pace schedule	3
Lecture content	4
Flexible schedule	5
Group discussions	6
Course materials	7

Q8. If you could change one thing about the course, what would that be?

I think I would change from the 9-5 schedule because sometimes I would not be there for the whole time, but a couple times I was. It could be from 9-3.

Q9. What would you suggest to improve the course content or structure?

I would maybe not rely on all of the historical knowledge because it didn't seem relevant to what we were doing.

Q10. How likely are you to would recommend this summer course to a peer?

Extremely likely Somewhat likely Neither likely nor unlikely Somewhat unlikely Extremely unlikely

Q11. Are you satisfied with the grade you received for this course?

- ☒ Yes
☐ No

Q12. Comments on Question 11:

I received an A and was extremely satisfied.

Q13. Do you feel that your academic performance was decreased due to the nature of the accelerated course?

- Strongly disagree Somewhat disagree Neither agree nor disagree Somewhat agree Strongly agree
- ☒ ☐ ☐ ☐ ☐

Q14. Comments on Question 13:

I still gave the same effort and worked hard on each project and assignment.

Q15. Would you take another summer accelerated Graphic Communications course in the future?

- ☒ Yes
☐ No

Q16. Please share any additional comments or experiences about the summer course. Please give as much detail as you can.

The class was well organized, but with a lot of content to learn. The small class size was the most convenient because I was able to get one on one time with the professor. The professor was amazing she was the nicest person ever and she knew exactly what she was doing. This course made me get ahead and now I am a sophomore with a junior standing.

Student D Individual Survey Response

Q1. How did you get accepted into the Graphic Communications program?

- ☐ Bridge student
- ☒ Change of major
- ☐ Was accepted straight into GC
- ☐ Summer Start program
- ☐ Transfer student

Q2. Do you believe you have retained a sufficient amount of information to move onto the next Graphic Communications course?

- Strongly agree Somewhat agree Neither agree nor disagree Somewhat disagree Strongly disagree
- ☒ ☐ ☐ ☐ ☐

Comments on Question 2:

I did not know a lot before going into the 1040 class and now I definitely know how to SP and the basics of flexo. I have attained all the knowledge I have on the processes and equipment. Moving on to 2070 I didn't run into problems with not knowing previous content.

Q3. Were there any lecture topics you believe could have been explained in further detail?

When we did whole lectures in one sitting I definitely retained a lot of the info and I took notes but when you never return back to a topic after initially learning it, I think it can definitely leave you quicker. For the notes I could look at them and share them with you. Let me know if you'd want to see them would probably be able to come up with some more specific topics if you want.

Q4. How satisfied were you with the class schedule?

- Extremely dissatisfied Somewhat dissatisfied Neither satisfied nor dissatisfied Somewhat satisfied Extremely satisfied
- ☐ ☐ ☐ ☐ ☒

Q5. Would you change anything in regards to the course schedule?

We went at a pace where she planned everything prior to the day. We followed the schedule. We would talk as a small group if we wanted to adjust the time we left for lunch or time we stayed out for lunch, etc. We ended up being able to leave early many days. There were only a few we stayed close to or 5 pm. So not anything I can suggest changing. I liked the 4 day a week.

Q6. Was the course breakdown (topics, assignments, etc.) clear and well organized?

Very clear Somewhat clear Not very clear Not clear at all



Q7. What aspects of the course did you find most beneficial? Rank your aspects from most beneficial at top, to least beneficial at the bottom.

Hands-on projects	1
Small class size	2
Flexible schedule	3
Group discussions	4
Fast pace schedule	5
Course materials	6
Lecture content	7

Q8. If you could change one thing about the course, what would that be?

I guess that it would not hurt to be a longer than only 10 day course. Like 15 and there could just be that much more time to go a little deeper and to still have buffer.

Q9. What would you suggest to improve the course content or structure?

The only thing I can think of is the multiple lectures and just word vomit that the slides would sometimes be. There is probably many more ways to teach the info from the lectures or discuss them.

Q10. How likely are you to would recommend this summer course to a peer?

Extremely likely Somewhat likely Neither likely nor unlikely Somewhat unlikely Extremely unlikely

Q11. Are you satisfied with the grade you received for this course?

☒ Yes

☐ No

Q12. Comments on Question 11:

I don't know specifically but I know I finished with an A in it. I also learned so much without a dent on my summer.

Q13. Do you feel that your academic performance was decreased due to the nature of the accelerated course?

Strongly disagree



Somewhat disagree



Neither agree nor disagree



Somewhat agree



Strongly agree



Q14. Comments on Question 13:

I was very engaged still and thinking and conversing. I was not at anytime aware of a decrease in my performance I came energized and fed and ready to be hands on and participative. That's a huge part.

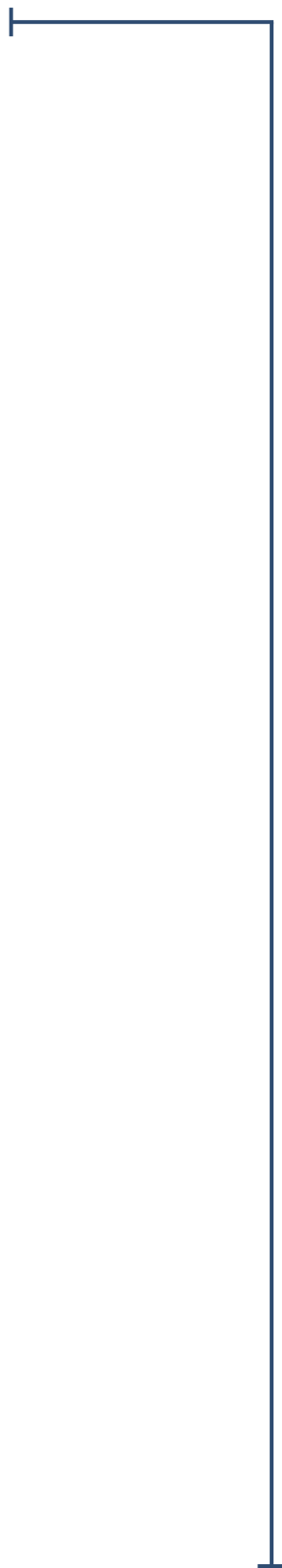
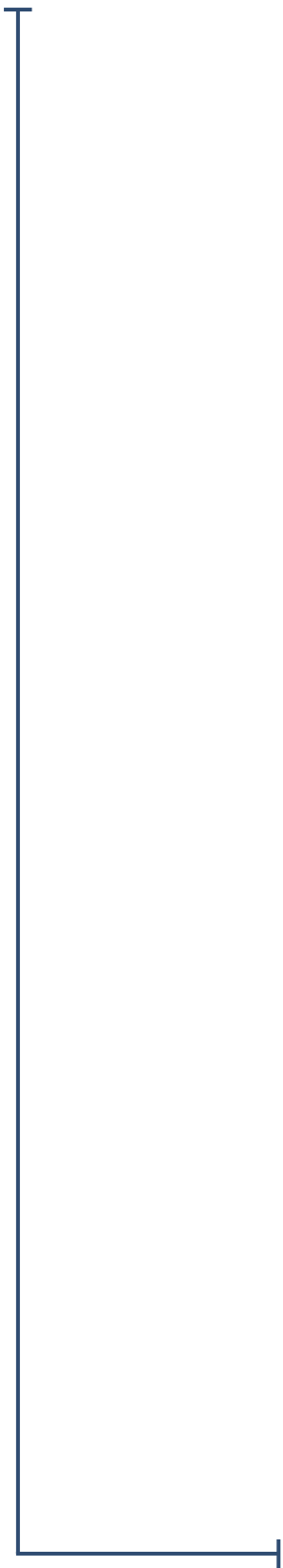
Q15. Would you take another summer accelerated Graphic Communications course in the future?

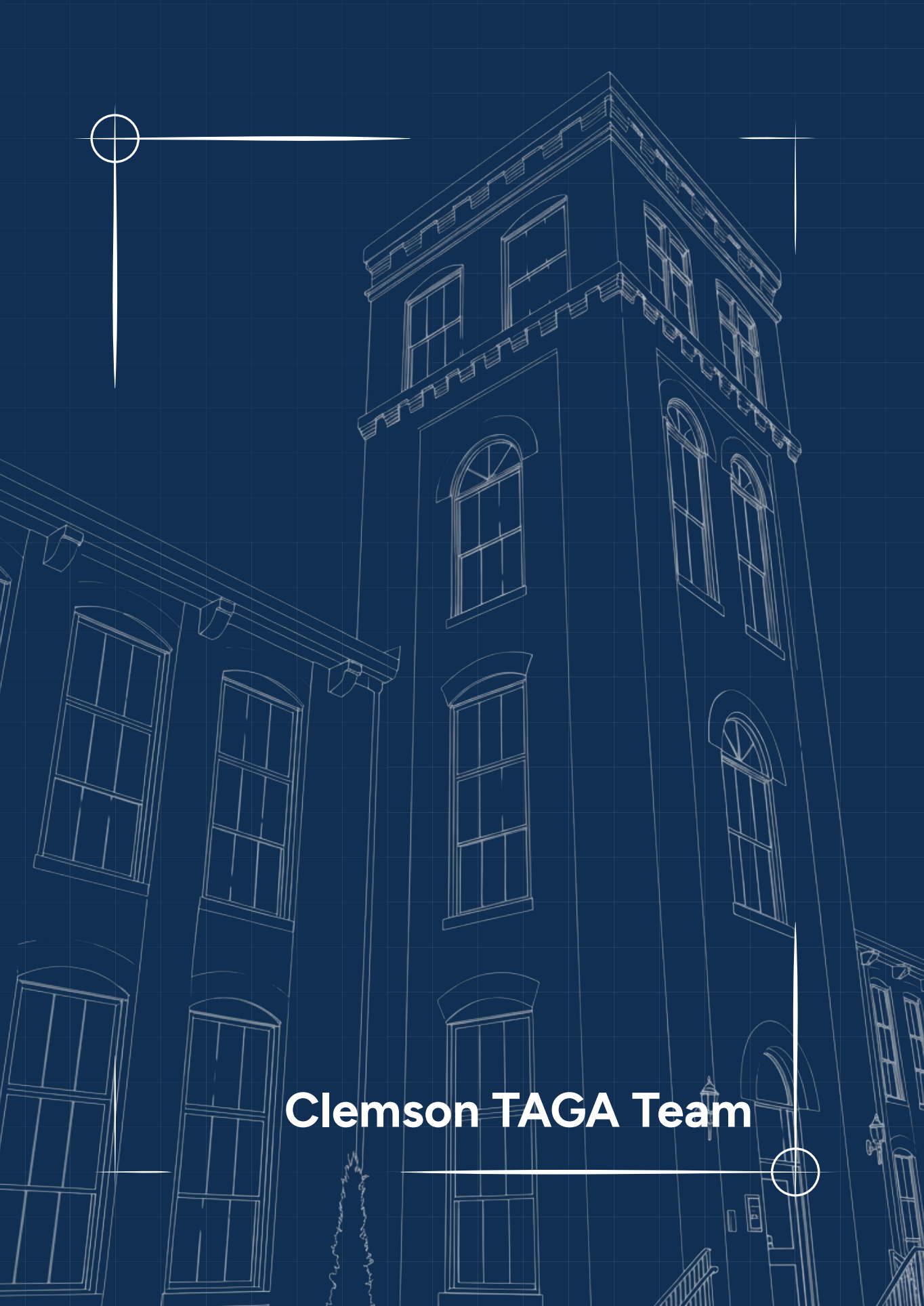
☒ Yes

☐ No

Q16. Please share any additional comments or experiences about the summer course. Please give as much detail as you can.

It welcomed a few faces I will always recognize around now. I know mrs. Great isn't with GC anymore but I liked her and how she was experiencing this with us and being flexible. She made it extremely clear what we had to accomplish and she communicated clearly.





Clemson TAGA Team

EMILY ALLEN



Emily Allen is a senior from Newberry, South Carolina, majoring in Graphic Communications at Clemson University. This is her second year as a member of TAGA. After presenting at the TAGA conference last year, she is excited to apply what she learned and continue growing within her major. Emily brings experience in graphic design, pre-press work, and digital content creation. She currently serves as Secretary of Clemson's academic fraternity for the graphic arts, Gamma Epsilon Tau (GET), and works in a marketing role with Clemson's Center for Student Engagement. In addition to TAGA, she is also involved in Clemson FCA and intramural sports. Emily looks forward to the opportunities ahead with TAGA, while continuing to develop her skills and build meaningful connections within the graphic communications field.

HAYDEN DENNIS



Hayden Dennis is a sophomore Graphic Communications major with a minor in Brand Communications. She is from Georgetown, South Carolina, and is a full-time student at Clemson University, where she is a member of Clemson FCA. This is her first time being a part of Clemson TAGA, and she works with her fellow teammates to build the TAGA website. Her favorite part of TAGA is being able to work with other people in her major to create something new, and she hopes that it will help her gain new experience. Some of her favorite processes are logo design, screen printing, and everything involving vinyl applications. She is very excited to be in Clemson TAGA and to work alongside all of her teammates.

SIMRAN GILL



Simran Gill is a sophomore at Clemson University studying Graphic Communications. This is her first year in TAGA, and she is very excited to have the opportunity to work on a team with the goal of fueling innovation in the graphic design and printing industry. Web design, screen printing, and flexography are some of her favorite processes to work with, and Simran is ready to bring her experience in these areas to Clemson's TAGA journal. On campus, she is involved as a DJ at Clemson's alternative radio station, WSBF, and has been heavily involved with the club since her freshman year.

AVA GOFF



Ava Goff is a sophomore Graphic Communications major at Clemson University and a first-semester member of TAGA. She hopes to gain valuable skills in publication design, print production, and time management through this experience. Ava is involved in several campus organizations, including serving as Graphics and Layout Editor for The Pendulum, Clemson's International Affairs Magazine, and as a Creative Media Assistant for Call My Name, an undergraduate historical research initiative. This past summer, she worked as a Public Relations and Communications Intern at a brand agency in London, England, further strengthening her passion for design and visual communication and her eagerness to contribute to TAGA.

GWENDALYNNE HANSON



Gwen Hanson is a junior Graphic Communications major at Clemson University. This is her second year with Clemson TAGA, and she is currently serving as Co-President alongside Brayden. Last year, Gwen was involved with journal design in the fall and production in the spring. Outside of TAGA, Gwen is Co-Banner Chair for her sorority (Gamma Phi Beta), is a teaching assistant for Dr. Blue, and pours into her degree, eager to learn all she can during her time at Clemson. In her free time, she loves to paint and watch the ducks in the botanical garden.

ERIKA HARDIN



Erika Hardin is from Charlotte, North Carolina, and is a junior majoring in Graphic Communications at Clemson University. Her main interests are direct-to-garment printing and the creative side of graphic design. She has previously worked with The Tiger for Clemson on social media. With The Tiger, Erika designed various types of social media posts including one that was submitted in the South Carolina Press Association Awards. Erika is excited to be back in TAGA for her second year and looks forward to learning new skills.

ELLA KING



Ella King is a Graphic Communications student at Clemson University with a strong interest in both the technical and creative sides of print and packaging. Originally from Moncks Corner, South Carolina, she is particularly drawn to production-focused processes such as screen printing, flexography, packaging development, and file preparation for print. This year marks her first semester involved with Clemson's TAGA student chapter, where she is eager to learn more about print optimization, quality control, and industry standards. Outside the classroom, Ella participates in extracurricular design work through campus organizations and sorority leadership, applying her skills to real-world projects and continuing to grow within the graphic communications field.

MAXON MORSE



Maxon Morse is from Indian Land, South Carolina. This is his first time being a part of the TAGA team, and he is very excited to work with everyone. Maxon's favorite printing process is inkjet digital due to the wide range of possibilities and innovation within the technology. He is also currently part of the Phoenix Challenge at Clemson and is conducting research on color accuracy in relation to foil. In his free time, Maxon enjoys playing video games, guitar, reading, and creating art.

BRAYDEN MYERS



Brayden Myers is the Co-President of Clemson TAGA 2026 alongside Gwen. Although this is his first year in TAGA, Brayden is excited to work alongside his team and apply the valuable knowledge he has gained while learning graphic processes. Brayden is from Lexington, South Carolina, and is currently a senior at Clemson University. He looks forward to pursuing a career in packaging and branding after college. In addition to his studies, he works as a teaching assistant for the Graphic Communications Department at Clemson. Brayden's free time, he enjoys spending time with friends and eating good food!

SOFIA PEREDA



Sofia Pereda is a Graphic Communications major at Clemson University and an active member of the Clemson Fashion Club and Clemson Photography Club. She grew up in France in a small town called Clermont-Ferrand, and from a young age, Sofia always had an appreciation for fashion and the various ways to express yourself, as well as street photography, which she picked up from her dad, who loves photography. Moreover, Sofia used to be a TA for screen printing and flexography for a full year, making her favorite process in Graphic Communications screen printing. She finds a lot of joy in wearing what she creates, as well as in the process of making the screens.

BELLA POLIZZI



Bella Polizzi of Dewey Beach, Delaware is a junior in Clemson's graphic communications program. She is also pursuing a double minor in brand communications and business administration. Bella is a part-time UPIC graphic design intern at Clemson Campus Recreation where she is working to promote the healthy lifestyle that the campus gyms cultivate. She is also the secretary for Gamma Epsilon Tau, an active member of creative inquiry Wide Format & Display, and the Director of Ritual for Sigma Kappa. This past summer, she thrived as a print production and marketing intern at Print Coast2Coast. In her free time, Bella enjoys hiking, traveling to new places, trying new foods, attending Clemson sporting events, and cheering on the Philadelphia Phillies. Post-grad, Bella hopes to pursue a career in advertising at the Walt Disney Company.

GABRIELLA RANDAZZO



Gabriella Randazzo is a sophomore majoring in graphic communications at Clemson University from Rhinebeck, New York. Gabriella is a proud member of Gamma Phi Beta and Gamma Epsilon Tau, and is also serving as a contributing graphics and layout editor for Clemson's The Pendulum. This is her first year working with TAGA and she is eager to do so, hoping to contribute as much as she can. Gabriella thrives in group environment excelling with time management, communication, and compromise. She looks forward to the exciting journey ahead.

ALEC RAPIER



Alec Rapier is a Senior from Sumter, SC and is currently in his first year of TAGA. Within Graphic Communications, his favorite process is screen printing, where Alec enjoys the hands-on nature and creative control it allows. Outside of the classroom, he works as a graphic design intern for the Women's Basketball program and also takes on freelance design projects in the sports industry. Alec is especially interested in combining design, athletics, and branding, and enjoys gaining real world experience that strengthens both his technical skills and creative thinking.

MADISON REEVES



Madison Reeves is a junior at Clemson University majoring in Graphic Communications. She is from Columbia, South Carolina. This is Madison's second semester working with TAGA. Last semester, her role in TAGA involved helping with the journal's production, and this year, she is excited to learn about how the journal design comes together. Madison is also a big fan of motorsports and football, and she plans to pursue a career in graphic design for an NFL team after college.

AMELIA SCHERER



Amelia Scherer is from San Diego, California, and is a senior Graphic Communications major at Clemson University. She is a varsity student-athlete and captain of the Clemson Women's Rowing team. This is Amelia's second year representing Clemson at TAGA, and she is excited to build on her experience from last year. Outside of class and athletics, Amelia works with Clemson Football's Creative Media team, where she designs graphics and takes photos. Balancing athletics, academics, and work has taught her discipline, collaboration, and adaptability, all qualities she looks forward to bringing to TAGA again this year.

DYLAN SMITH



Dylan Smith is a Graphic Communications student at Clemson University from Anderson, South Carolina. This is his first semester participating in TAGA, where he is eager to expand his knowledge of print and design. Dylan enjoys hands-on processes such as screen printing and flexography, where he experiments with color, tints, and alignment to achieve strong results. Outside of TAGA, he serves as a Teaching Assistant and explores his interest in emerging technologies like 3D printing. Dylan looks forward to contributing to the TAGA journal and further developing his skills through collaboration and innovation.

SAVANNAH SMITH



Savannah Smith is currently a sophomore Graphic Communications major with a Fiction Creative Writing minor. She is from Greenwood, South Carolina and has always been a huge tiger fan! Savannah is currently an intern at Clemson University as a graphic designer for the Decipher magazine on campus. Her favorite part about Graphic Communications is the wide range of focuses and skills to be learned. She loves being able to constantly create, whether screen printing, developing and designing a website, or digital design!

EMILY TAYLOR



Emily Taylor is a graduating senior majoring in Graphic Communications at Clemson University. She has been a member of TAGA for three years, serving as Production Lead for the 2024 chapter and President for the 2025 chapter. Through these roles, Emily has developed substantial experience in print production, bookbinding, project management, and leadership while overseeing the technical journal. She is also a member of Gamma Epsilon Tau and a teaching assistant in the Graphic Communications department, guiding students through the Adobe Suite. Her professional interests include customization and decoration through sublimation and direct-to-garment printing. Recently, she explored wide-format printing through her internship with Red Falcon Ink in the Fall of 2025.

EIAN TORRES



Eian Torres is from Atlanta, Georgia, and he is a Junior Graphic Communications major at Clemson University. This is his third semester participating in TAGA, and he is extremely excited to work with his peers on all aspects of production and design for TAGA. He is especially happy for the opportunity to work in screen print/production because, over his first couple of years here at Clemson, he has developed a special fondness for screen print. In addition to his enthusiasm for t-shirt production, he is eager to collaborate with the package production team to develop an innovative, sustainable, and effective product.

HALEY TYLER



Haley Tyler is a Junior Graphic Communications student from Mount Pleasant, South Carolina. This is her first year doing TAGA but she is very excited to learn more about the processes of creating a journal and growing in her teamwork skills. In her extracurricular activities, she is a part of a Campus Ministry called Campus Outreach and is the team captain for social media. She has also interned for a small business, Michael's Barkery, working on their brand marketing and materials design.

CASSIDY WAITES



Cassidy Waites is a senior Graphic Communications major from Newberry, South Carolina, and a full-time student at Clemson University. She is passionate about graphic design, with particular focus on branding, publication design, and marketing. Now in her third year with Clemson TAGA, Cassidy has served as Vice President, gaining hands-on experience in publication design, management, and print production. She has attended the annual TAGA Conference twice, connecting with industry professionals and graphic design students from across the country. Cassidy values collaboration and takes pride in contributing her design and print expertise to the production process. She is grateful to be part of a supportive, hardworking team and to represent Clemson University and its Graphic Communications department through TAGA.

DR. CARL BLUE



Carl Blue is an Associate Professor for the department of Graphic Communications at Clemson University, and the advisor for Clemson TAGA 2026. He currently has 20 years in higher education. His research explores the intersection of artificial intelligence, design pedagogy, and digital print production—advancing innovation in both educational practice and industry application.

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