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Claudine Jaenichen

Teaching advocacy and evidence-based design to undergraduate graphic design students

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In 2009, I published a report titled "Medicine information and packaging design initiated in an undergraduate graphic design curriculum" for the Information Design Journal's (IDJ) Healthcare Issue (2010). It was the first time I assigned a medicine packaging project for undergraduate students pursuing a BFA degree in graphic design at Chapman University. Eight years later, the project is still being assigned with a more robust participatory and user-testing component, tighter constraint requirements, and multi-layer deliverables. We continue to have one Information Design class in the BFA Graphic Design program. The course is founded on principles that I was introduced to at the University of Reading as a graduate student.

1. Background

In 2009, I published a report for the IDJ's Healthcare Issue (2010), "Medicine information and packaging design initiated in an undergraduate graphic design curriculum." It was the first time I assigned a medicine packaging project for second and third year undergraduate students pursuing a BFA degree in a graphic design program at Chapman University. The project introduced students to participatory methods, user testing, and concepts in benchmarking. The project also provided skills based on an analytical and diagnostic assessment modelled after Communication Research Institute's methods of scoping, benchmarking, designing, testing, and refining design work based on performance tasks.

This project is the only experience that undergraduate design students in our program have in evidence-based design work and in understanding participatory design with an exercise of qualitative methods. The importance of providing students with projects that require evidence supported outcomes is the ability to define and measure performance tasks based on understanding the context, usefulness, and expectations between the communication objectives and the user. Without this skillset or acknowledgment in design education, students rely on self-experience, implicit bias, and on an inward and distant view of assessing "success" based on visual pleasing aesthetics (e.g. "this *looks* better") rather than actual function (e.g. "this *works* better and I can prove it").

Two curricular changes have influenced the medicine information project since 2009. We introduced a freshman-level course in 2013, Research Methods for Graphic Designers, which became a required course for all design

majors. The course introduced primary and secondary research, interviewing, user testing, ethnographies, analytics, heuristic evaluation, and other best practices. The course also introduced skills for documentation, writing, and note-taking. Making this course a freshman-level course emphasized the importance of research methods in our design program. By the time students from this class enrolled on my course, Introduction to Information Design, they had already had a year of exposure to a variety of research material and practices.

The second change was in the project assignment itself. With the project now in its 11th year, I included a specific user-scenario that would impact the approach to sequencing and ordering information, packaging, and thoughts about medicine usage. The project continued to be assigned to second and third-year undergraduate graphic design majors. Additionally, students produced an infographic of how the medication worked to get a better understanding of the medicine. The infographic was an exercise in research and not part of the evidence-based supported final deliverable. The infographic would be included in the students' process folder as an exploration in engaging with various research models and being able to demonstrate their understanding.

2. Problem definition: The assignment

In previous years, the medicine project was scheduled as the second project of the semester since it was considered to be the most robust of the four projects assigned in class. This year, however, it was the last project of the semester and it had to be completed within six weeks—one week to complete the infographic; one week for the initial benchmark interviews; two weeks to redesign; two weeks to test the redesign and finalize it. The reason for having the infographic component as the first phase of the project was to get students committed early to the research phase, which require them to understand the medicine's history, chemical functions in the body, and trends of the medicine in the marketplace. Within the schedule, time was provided for lectures, demos, practice interview sessions, and critiques. With 22 students conducting their own projects, we were pressed for time.

Students were provided with a project sheet that included the context of the project, the schedule, a list of design constraints, needed content, software applications, and required final deliverables. Also, students had to submit a process folder documenting their research, including their infographic, methodologies, and design phases. I included a specific scenario as a revision exercise. Students were encouraged to choose an allergy medicine or a motion sickness prevention medicine offered on store shelves—i.e. medicine which can be purchased without a prescription. The revised packaging had to address an "on-the-go" scenario, anticipating that the user of the medicine would discard excess packaging material (e.g. boxes, pamphlets, etc.), and consider the necessary information that the medicine must always have on the smaller sized package. The package must be able to fit into a small pocket of a purse, backpack, or a back pocket.

The learning objective of the medicine packaging project was for students to engage in qualitative methods to help them analyze current design and legibility issues in medicine packaging. By doing the project, students also learned to define performance tasks needed in medicine labelling and to determine how consumers interact with medicine information. In the final stage of the project, students would be able to make design decisions based on the information they received.

3. Infographic: Engaging with research

A new component of the project was the creation of an infographic to gain an understanding of the medicine chemistry, history, and of their users. The infographic

had to include two or more rhetorical modes—informative, instructive, descriptive, and/or persuasive—and could include numbers, illustrations, texts, and images. Students were provided with lectures, design principles, and examples including work and critical writings from Otto Neurath, Edward Tufte, Colin Ware, and Jaque Bertin, as well as interdisciplinary approaches and international examples from David McCandless, Francesco Franchi, Hans Rosling, Nigel Holmes, Thomas Molén, John Grimwade, and Aaron Koblin. With only a week dedicated to the infographic, most of the research was reviewing pharmaceutical companies, data on chemistry, and available medicine information online. There were a variety of approaches in how the information was presented and the level of depth of the information provided. The figures below show students' examples of infographic solutions and categories of influence. Although the infographic portion of the project did not require any evidence-based outcomes, the objective of the infographic was to provide students with a research exercise where they had to organize their various research modes and *show* their depth of understanding.

Mollerup's *Data Design: Visualising quantities, locations, connections* states a case for visualizing connections with a "goal to communicate, to record, and to understand" (Mollerup 2015). The students' examples below guided the viewer using macro/micro narrative using schematics, diagrams, and sequencing of information.

Nigel Holmes was known for persuasive decoration in his approach to highly illustrated visualizations. Some of the critique in Holmes's work is a caricature of data placing more importance on the illustrative ambiance, which Edward Tufte termed as "chartjunk" in his book *Envisioning Information* (1990). I found that most students leaned towards this approach because they found it challenging to commit to content and were eager to apply aesthetics prematurely. An example of this was seen during the process when students would show design work (e.g. color palette, typeface, sample text placement, images, illustrations, etc.) for critique before deciding what the content would be.

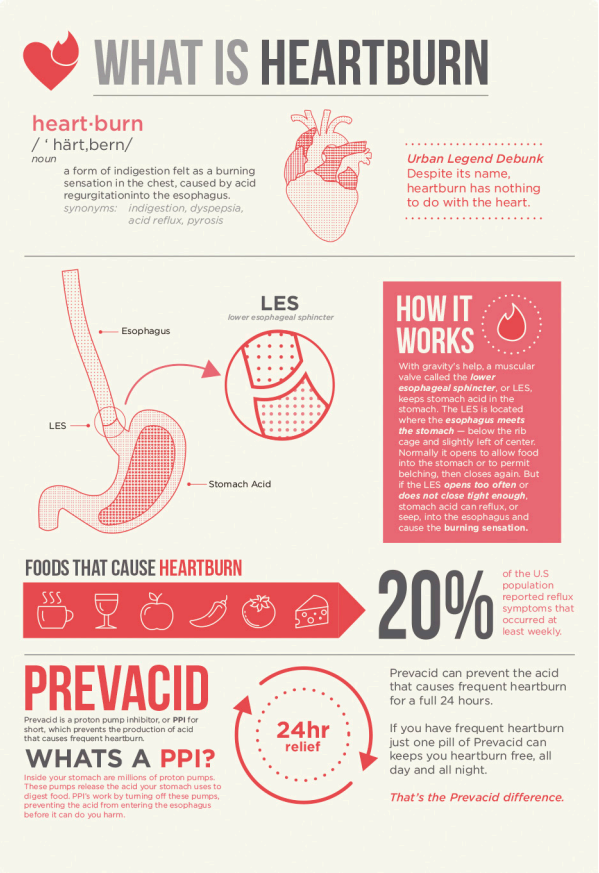

Figure 1a. Kyra Brandman's (junior 2017) infographic debunked the association of "heartburn" with the heart and showed that heartburn is actually associated with the esophagus. She made connections with physical symptoms, causes, and relief.

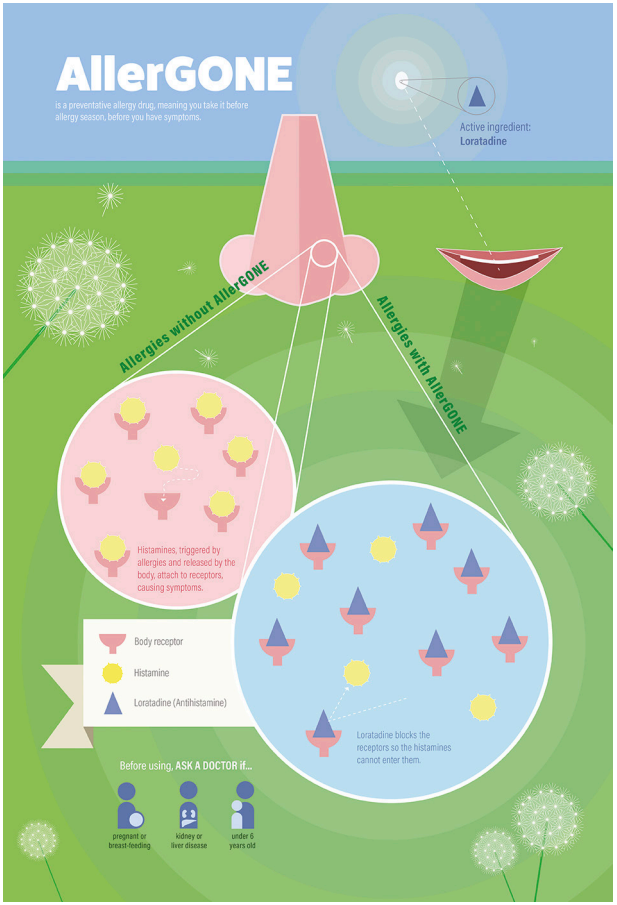

Figure 1b. Shelby Edmunds's (junior 2017) infographic explained how *AllerGONE* worked by following its active ingredient, Loratadine. She showed her understanding as two illustrated stories about how allergens affected the body, with and without, Loratadine.

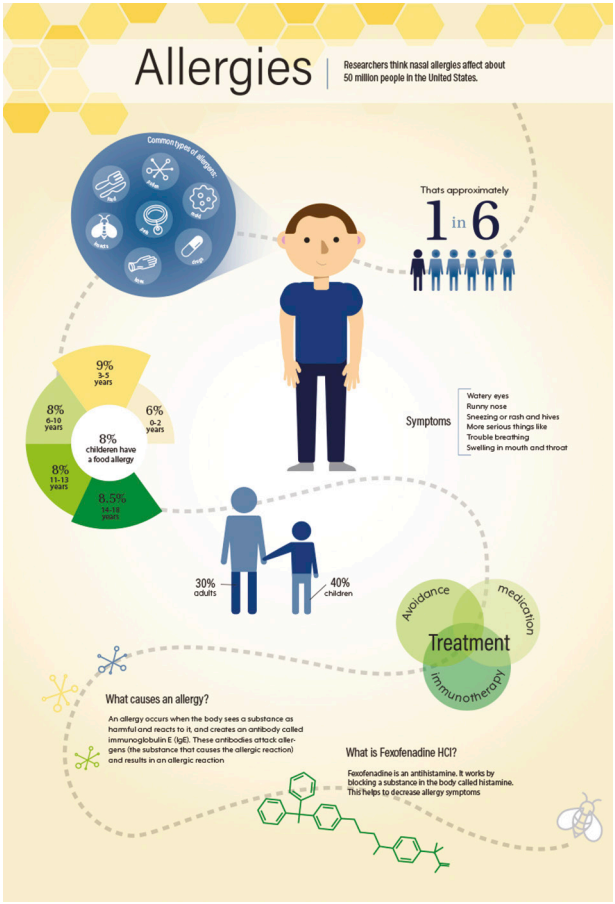

Figure 1c. Bobbi Stalnaker's (senior 2017) infographic showed her understanding as a controlled path of information sequentially organized beginning with allergy education that led to treatment.

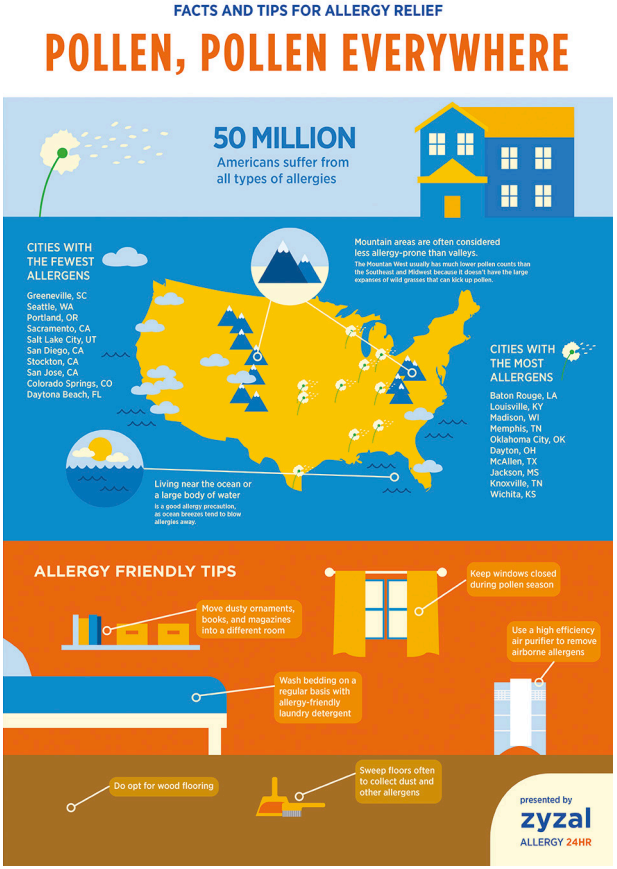

Figure 1d. Audrey Chang's (senior 2017) infographic showed the data she collected as it related to the causes of allergies in the United States. For the informative portion, the U.S. map included markers of areas where there were more allergens (marked by a dandelion icon) and fewer allergens (marked by a cloud). She found it helpful to use callouts for explaining why certain geographically places had fewer allergens, how to keep an allergy-free living area, and how to keep allergens out.

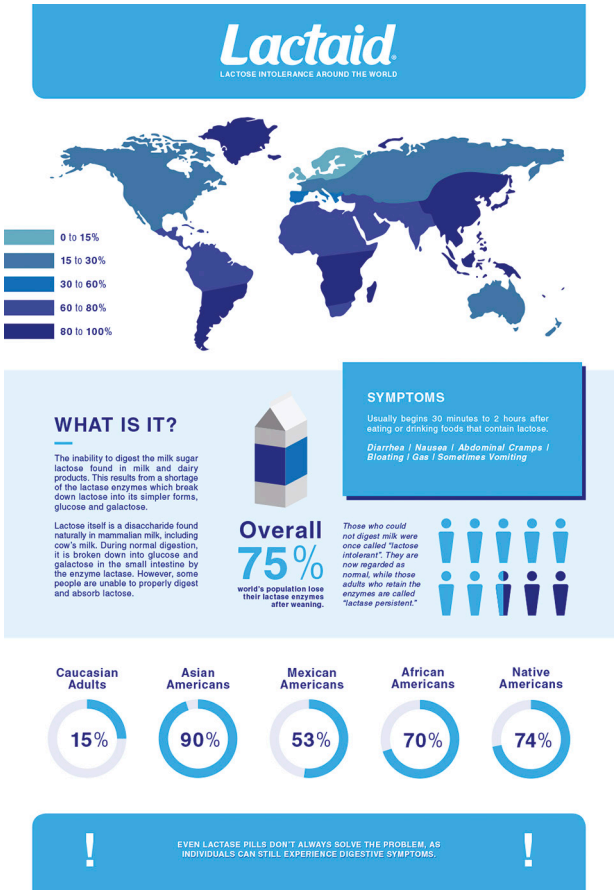

Figure 1e. Gillian Steinmetz-Blair's (junior 2017) infographic helped her learn that someone with lactose intolerance is not someone who is allergic to milk products, but rather a person whose body does not produce enough lactase (an enzyme). She learned that lactose intolerance causes bloating, cramps, gas and even diarrhea. Some may still have certain dairy products depending on the severity of the intolerance. Those who could not digest milk were once called "lactose intolerant." They are now regarded as normal, while those adults who retain the enzymes are called "lactase persistent."

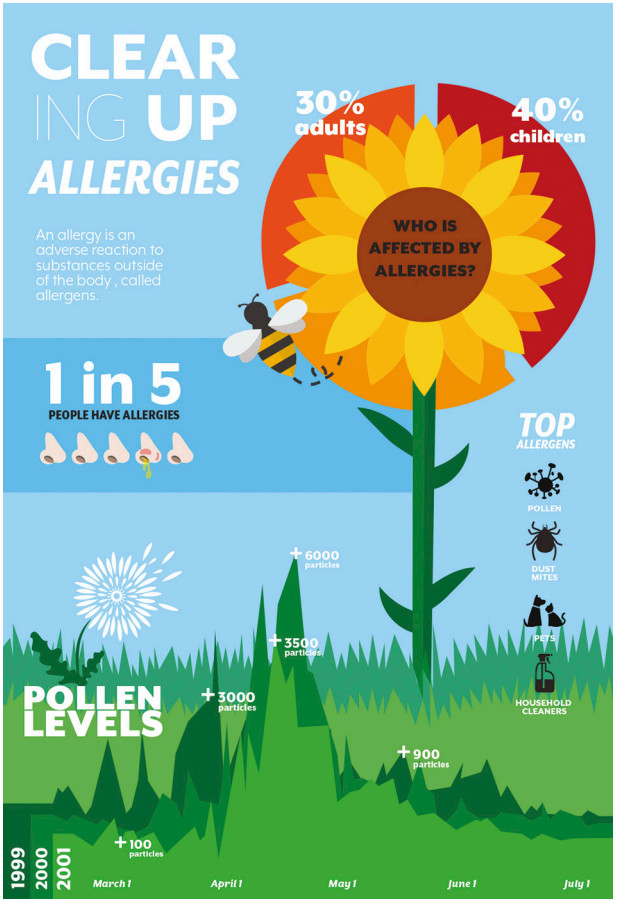

Figure 1f. Kalyn Boukather's (junior 2017) infographic unintentionally referenced Holmes's "Diamonds Were a Girl's Best Friend" chart printed in *Times Magazine* in 1983. The viewer gets lost in the illustration with secondary and tertiary hierarchy to data. At the bottom of the composition, what appears to be jagged grass, is in fact a fever chart that depicted pollen levels from three different years.

4. Methodology and design process

4.1 Interviews and summary sheets

Students were required to test six unique participants (3 for the initial benchmark and 3 for the redesign). Participants were male and female, aged 25 years or above—this age requirement was chosen so that students would interact with people who were not their peers. The age and level of education of the participants varied but they all had English as their main language. Some students included healthcare professionals in their groups while others included retired grandparents with visual impairments. Because this was an introduction to a participatory study, although students were made aware of the importance of documenting individual variances, specific consistency in abilities or backgrounds in their interviewee groups was not required of them. We continued to reference Ruth Shrensky and David Sless's *Designing medicine labelling for people* (2006) and *Labelling Code of Practice* (2004) developed by the Communication Research Institute. Students defined performance tasks and finalized their interview questions for both phases of testing.

In-class we did a number of exercises on developing performance tasks, interview questions, and how to conduct interviews. Students were then given the following criteria to recruit participants:

- Contact and confirm participation of six people, 25-years or above
- Give them each a copy of the project sheet
- Each participant must agree to a "consent recording" providing the information below:

  a. their name and relationship to the designer;
  b. their age;
  c. consent to participate in the project.

The instructions regarding summary test sheets were the same instructions provided for the 2009 assignment:

> *Students were instructed not to conduct interviews in groups and that sessions had to be completed directly with each individual separately. Participants included faculty, staff, grandparents, older siblings, parents and supervisors. Students completed an "introductory statement for testing" (Sless 2006) introducing themselves, the project and the interview process. Students documented the interviews in various ways including an "X" to indicate a "no" answer, a checkmark to indicate a "yes" answer, a descriptive note, or a combination of all methods. Two rounds of interviews were conducted. The first round of interviews tested the performance of the original packaging. Students applied the data from the first interviews and revised the design with the aim of improving its level of performance. Revisions were than tested in the second round of interviews.*

A major revision to the project was conducting the second round of interviews with three *unique* participants in order to achieve an unbiased set of qualitative data. Figure 2 shows an example of a student's first and second summary sheets with their interview notes included. Students were taught to analyze data and use the findings to inform design decisions. They tested their revised design solution and experienced directly how successful they were in transforming the qualitative data as it related to the user and performance tasks.

After her first round of testing, Chang stated that "the interviews and user testing were vital to the function and usability of the design. The wide range of ages helped in the development of a design solution that could cater to for a vast audience. The original box had a good type size for readability and the table on the back showed a clear distinction between information. The original box was very roomy for the thin sheet of blister unit that was included. Ultimately, the box took up more space than necessary, making it prone to being thrown away along with the important information."

After her second round of interviews Chang stated:

> While the interviewees could find information fairly easily and the table divided information nicely, the overall design could be further improved for a better reading flow. The table utilized a colored box for the headers so users could pick what category they wanted to see first. The directions table was simplified into one column rather than the smaller table used in the original. Serious information was blocked off in orange. There were age groups that absolutely could not take the medicine and those that must consult a doctor beforehand. The age group I tested missed that they needed to consult a doctor, so the directions were more clearly reiterated [in my redesign]. These age groups now had orange headers and the rest had blue headers. There was also the choice to take a whole or half tablet depending on the severity of the symptoms. A tablet icon was used to visually guide the user to determine whether their symptoms were mild or severe. Extra information that was not as immediate was placed in the table below. The tablet blister unit is now shown against a blue background to make the white pills pop out. The overall packet minimized the chances of consumers throwing out the information by keeping the pills and directions together as one unit.

Students were able to gain insight into the problem, not only through verbal responses but, more importantly, through the non-verbal interactions with medicine information. Students observed participants answering questions without looking at the package or information.

XYZAL
Interview Summary Sheet 1
May 1, 2017

	Eva	Jennifer	Ramy	
1. Do you take any kind of medication? (For how long and for what reason?)	O Vitamin supplements	O Cholesterol medicine (1 yr)	O Cholesterol, blood pressure, Type 2 diabetes, thyroid (10+ yrs)	All take some type of medication in pill form.
2. What is the name of the medicine?	O	O	O	Said the name quickly and with confidence.
3. Have you taken XYZAL before? If not, what is your preferred allergy brand and why?	X Claritin most known, but no preference	X Benadryl, only one she knows	X Zyrtec, Claritin, but Bendaryl is preferred because it's more accessible	None have used XYZAL before. Benadry seemed to be the more preferred allergy relief brand.
4. Do you know what the medicine is for? What symptoms is this product for? (show me)	O	O	O	Answered without a problem.
5. How many tablets does this box contain?	O	O	O	Answered without a problem, but unnatural movement of eyes from bottom to top to find it.
6. Can you find the expiration date? Is it legible? (show me)	O Showed quickly and immediately	O Showed quickly and immediately	O Showed quickly and immediately	Turned the packet to the back and read it right away.
7. Can you tell me how long XYZAL will relieve your symptoms for? How long does it take for XYZAL to kick in? (show)	O	O	O	24 hours was immediate, but to find how long it takes to kick in took awhile until they opened the packet. Stated it was important info but didn't expect it on medicine packaging
8. Do you know what dosage to take and how to take it according to your age? What about for a 12 year old?	O Would give 12 yr old 1 tablet same as herself	O Would give 12 yr old 1 tablet same as herself	O Would give 12 yr old 1 tablet same as herself	Understood the dosage and age exceptions.
9. What would you do in the case of an overdose?	O read the back, not finding immediately	O found immediately	O said she just read it but couldn't find again immediately	Overall they found the information though it was not immediate for some, but it didn't take long either.
10. Do you know how to administer the medicine apart from the box?	O pop it out from the packet	X would peel it off, children would definitely not be able to get to it	O press to push the tablet out	The way the dividers were set up for the tablets was a little confusing as to whether it was a peel off or a push out.
11. Tell me a good point and a bad point about this packaging?	Easy to read, and find info with colors and icons, hierarchy of info is good, is a little hard to open	Marketing tells you how long it takes to kick in, doesn't know how to get medicine without tearing it apart.	It's compact and easy to carry in your purse or pocket, markings for the tablet make it confusing for how to take it out,	Definitely need to fix dividers for the tablets. Instead of a table, do a full bleed of the lines so it looks like you push it out rather than a peel back.
12. How would you take this medicine in a to-go situation?	Would take pack with her, or cut out number of pills needed	Small enough to carry anywhere, but would tear off one or two	Would stick the whole thing in her purse.	Some would tear off the amount needed, but taking the entire packet is now a considered option.
13. Is there anything we haven't discussed you would like to bring up?	Not the easiest name to pronounce	8 tablets on the top threw her off, likes the actual size of tablet on front	likes to see exact description of pill on the front since she takes many pills that could get mixed up	Small details to change to make usability and accessibility of information much easier for the consumers.

Figure 2a. Example of student interview notes and first round summary sheet for original medicine packaging and information (Audrey Chang, senior 2017).

XYZAL
Interview Summary Sheet 2
April 14-15, 2017

	Wendy	Patti	Mike	
1. Do you take any kind of medication? (For how long and for what reason?)	O Naturemade multivitamins, joint medicine for running	O Cholesterol medicine (1 yr)	O Cholesterol, blood pressure, Type 2 diabetes, thyroid (10+ yrs)	All take some type of medication in pill form.
2. What is the name of the medicine?	O	O	O	Said the name but with hesitation and lack of confidence.
3. Have you taken XYZAL before? If not, what is your preferred allergy brand and why?	X Claritin, sees it everywhere	X Claritin, doesn't make her drowsy, works better than others	X No preference, all work the same to him but mentioned Claritin by name	None have used XYZAL before. The preferred allergy brand for all three was Claritin because it works for them and is the most recognizable.
4. Do you know what the medicine is for? What symptoms is this product for? (show me)	O	O	O	Answered without a problem.
5. How many tablets does this box contain?	O	O	O	Answered without a problem.
6. Can you find the expiration date? Is it legible? (show me)	O Found it but difficult to read in the dim light	O Eventually found it but incorrectly said the date the first time	X Could not find it on the box, eventually saw it on the insert	Eventually found it but it took roughly a minute or more to find it. All turned box around and skimmed the enitre back. Legible at a certain angle or under more light.
7. Can you tell me how long XYZAL will relieve your symptoms for? How long does it take for XYZAL to kick in? (show)	O	O	O	Found first one without a problem. Second information was harder to find, but it would be easily found if they were to open the box to use it.
8. Do you know what dosage to take and how to take it according to your age? What about for a 12 year old?	O Would give 12 yr old 1/2 tablet compared to a 30 yr old	O Missed info that 65+ should ask a doctor, saw it eventually	X Missed info that 65+ should ask a doctor	Understood the dosage, but some missed the age exceptions. All got correct dosage for 12 year old.
9. What would you do in the case of an overdose?	O Says number to call is always on the bottom from her experience	X Missed info, said there should be a number to call	O Took a long time to find it	Only one saw the number to call in case of overdose. Got lost in information. Needs more distinction.
10. Do you know how to administer the medicine apart from the box?	X Would assume one tablet, and half for child	X Would assume one tablet but there is the break in for halves	X Wouldn't know, would assume one tablet, expiration date on insert is clear	All said they wouldn't know explicitly, but would assume to take 1 for themselves.
11. Tell me a good point and a bad point about this packaging?	Purpose is clear, good colors; expiration date hard to read.	Text size easy to read, information broken down in boxes, don't like pull tab	Fairly easy to read, not too small, front very clear, don't like pull tab	Definitely need to fix expiration date placement and treatment on the box. Text size was good for the older participants so need to keep that legibility. Need a picture or indicator of how to split the pill in half. Most not a fan of the pull tab packaging because it is difficult to get to.
12. How would you take this medicine in a to-go situation?	Would remove individual pills	Would break off pieces and carry just the pills	Would just bring the pills if he knows how much to take, tear it off	Box with information is not taken to-go so directions need to be memorized. Packaging that combines the information and pills should be considered.
13. Is there anything we haven't discussed you would like to bring up?	Good it tells you what temperature to keep the medicine at	Well laid out, good colors, doesn't have more info than you would want	Compared to most over the counter seems fine, pretty big package for 10 pills but readable	Good information but some information is placed in ambiguous or unnoticed places on the box. For to-go, size should be condensed without compromising legibility.

Figure 2b. Example of student interview notes and second round summary sheet for redesigned medicine packaging and information (Audrey Chang, senior 2017).

For example, when asked "what is the dosage?" some participants would provide an answer based on their own experience with the medicine without referring to the information on the material. Students were prepared to follow-up with "can you show me where that information is located on the label/package?" enabling the student to observe issues with information sequencing, hierarchy, type size, language, etc. When questions were successful, students could explore changes in the redesign utilizing design principles and re-evaluate performance tasks on the second round of testing.

5. Evaluation: Medicine information and package redesign

Identical to the 2009 project, "students were required to review all of the packaging elements (i.e. inserts, flaps, etc.) that came with the original product. Students could add, delete and alter elements if their decision was supported by the interview data." Students had the freedom to rewrite, reorder, and explore plain language approaches to the medicine information according to their interviews and analysis of the original packaging. Students were given a review so as to familiarize themselves with the Federal Food and Drug Administration (FDA)'s Code of Federal Regulations (CFR) Title 21 (§211.122—Materials Examination and Usage Criteria and Drug Facts labeling requirements in 21 CFR § 201.66) and understand the realities and context of designing under government regulations. Students adhered to the FDA's CFR content regulations but had the freedom to improve linguistic and graphic presentation of the information that addressed issues in their user testing.

Students also had specific instructions to consider packaging for "on-the-go". Anticipating that the user of the medicine would discard excess packaging material (e.g. boxes, pamphlets, etc.), students had to consider the information that should always appear on a smaller size package. Figure 3 presents examples of student medicine package and information redesign.

Figure 3.1a. Original packaging and information for *Xyzal* allergy medicine.

Figure 3.1b. Revised design (Audrey Chang, senior 2017).

In addition to the participant's feedback mentioned in the summary sheets above, Chang provided an excerpt of her design process, evaluation, and solution:

> The final design was a trifold packet that was slightly wider than an iPhone 6. The packet was thin and compact which allowed it to fit anywhere, whether it's in your purse or a drawer. The packet was closed together by a tab on the front that tucks into the back. In order to gain consumer trust and confidence in the product, confidence in being able to pronounce the name is important; especially if you were to recommend it to someone else, hence the re-spelled name from *Xyzal* to *Zyzal*. The logo was less crowded by having the secondary information on the ring of the circle. The bottom left provided the symptoms that the medicine treats and how long it will relieve them for. The bottom right stated the number of tablets included and the actual size. An arrow motif was used throughout the design. The arrow circle represented the day to night, 24-hour relief. The number of tablets was also within an arrow that points to the tablet icon.

> On the back, emergency information was within an orange arrow that points to the expiration date. They act as visual guides as well as colored spaces for important information that was visually set apart. On the left was the back of the blister unit that restated the name and expiration date and reminded users to check the correct dosage. A closer look at the directions was offered inside. There were age groups that absolutely could not take the medicine and those that must consult a doctor beforehand. The age group I tested missed that they needed to consult a doctor, so the directions were more clearly reiterated. These age groups had orange headers representing that message. There was also the choice to take a full or half tablet depending on the severity of the symptoms. A tablet icon was used to visually guide the user to determine whether their symptoms were mild or severe. Extra information that was not as immediate was placed below the table. On the right hand side the tablet blister unit is shown against a blue background to make the white pills pop out.

Kelly provided an excerpt of her design process, evaluation, and solution:

> Most of the research focused on the interview process, both in relation to the original packaging and the first redesigned prototype. Through the interviews, I discovered design issues about the packaging that I could change or improve. My main finding was that the name *Xyzal* was too difficult for many people to say. Therefore, I decided to change the name to *Zyzal* as this was much easier for people to pronounce. I also improved instructions that some participants had a hard time following. I streamlined all of the information on the packaging and made it one column so that it is was easier for the user to follow the order. As for the packaging, a dial was used to separate seven sections with one pill for a whole week. A white arrow shaped pattern was used around the front of the packaging as well as a numbering system. When you turned the package over, a medicine pamphlet with all the necessary information was folded into a sleeve. The hierarchy of the type provided users with an easy way to understand the flow of sequence as the design and typography guided them through the information.

Chovanec provided an excerpt of her design process, evaluation, and solution:

> *AllerClear* is Costco's generic brand of allergy medicine. Many participants had not heard of *AllerClear* and thought the design of the logo and packaging would not entice them to buy the medicine over a name brand. Participants commented that the current packaging for *AllerClear* was overwhelming and that they would change the colors so as to represent a calmer and "uncongested" feeling. Many interviewees also mentioned that they prefer their medicine packaging to be as simple and to the point as possible. Allergy medicines relieves unwanted symptoms and the packaging should mimic that relief from tension. *AllerClear* is currently sold in a small container with 365 tablets. However, the medicine only lasts a year and many people felt they would not use all of the tablets before the medicine expires. The new packaging held three individual booklets (each booklet with 21 tablets) so that users could take the medicine as required and not have to worry about carrying around an entire year worth of medicine. The booklet included instructions and warnings written on the spread. The back of the pill booklet had other important information the user would need to know. The main packaging had the name of the medicine,

Question	Sydney	Eden	John
1. What is the brand name of this medicine and what is it used for? How did you find that	I can't say it, is it zyzal? On the front of the package.	Xyzal. On the front of the package.	Zyzal? On the package!
2. Can you identify what symptoms the product is used for?	Allergy relief.	Allergy relief. Sneezing, runny nose, itchy nose, eyes and throat.	Sneezing, runny nose, itchy nose, eyes and throat.
3. Under what circumstances should you not use this product?	If you have kidney disease. If you have had an allergic reaction to its ingredients.	If you have kidney disease. If you have had an allergic reaction to its ingredients. If you are under 6.	If you have kidney disease. If you have had an allergic reaction to its ingredients.
4. Can you locate and read the active ingredients for me?	Yes. (stated ingredients)	Yes. (stated ingredients)	Yes. (stated ingredients)
5. Can you locate and read the inactive ingredients for me?	Yes. (stated ingredients)	Yes. (stated ingredients)	Yes. (stated ingredients)
6. Can you locate the dosage instructions?	Yes.	Yes.	Yes.
7. Do you understand these dosage instructions? Can you find which dosage you personally would take?	Yes. 1 pill in 24 hours.	Yes. (stated ingredients)	Yes. (stated ingredients)
8. Is there anything that could have been done to make the dosage instructions more clear to you?	Maybe section them off better.	Bold the most important one.	No, they were easy to understand
9. Can you locate the expiration date and read it aloud for me?	No.	Yes. 07/2019	Yes. 07/2019. (took a long time)
10. Can you find how many tablets come in the package?	10	10	10
11. How long should this product last you if you were to take it everyday based off of your personal dosage?	10 days.	10 days.	10 days.
12. Can you find a product description on this box?	Yes.	yes.	Yes.
13. Where are the warnings found? Are they clear and easy to understand?	On the back of the box. Yes.	On the back of the box. Somewhat, could have been easier to find.	Yes they are on the back of the box.
14. What number should you call if you have any questions, comments, or concerns?	call 1-800-633-1610	call 1-800-633-1610	call 1-800-633-1610
15. Where do you store this product?	between 20-25 degrees	between 68-77 degrees Fahrenheit and 20-25 degrees celsius.	

Figure 3.2a. Summary test sheet from interviews about the original product (Peyton Kelly, junior 2017).

Question	Kyla	Anna	Ryan
1. What is the brand name of this medicine and what is it used for? How did you find that	Zyzal! It's right on the front!	Zyzal. It's on the front	Zyzal, on the package
2. Can you identify what symptoms the product is used for?	Allergy relief.	24 hr allergy relief, for sneezing, runny nose, & itchy nose, throat, and eyes.	Sneezing, runny nose, itchy nose, eyes and throat. Allergies!
3. Under what circumstances should you not use this product?	If you have kidney disease. If you gave ever had an allergic reaction to any ingredients in this product.	ummmm….if you are under 6. If you have kidney disease. If you gave ever had an allergic reaction to any ingredients in this product.	Under 6. If you have kidney disease. If you gave ever had an allergic reaction to any ingredients in this product.
4. Can you locate and read the active ingredients for me?	Yes. (stated ingredients)	Yes. (stated ingredients)	Yes. (stated ingredients)
5. Can you locate and read the inactive ingredients for me?	Yes. (stated ingredients)	Yes. (stated ingredients)	Yes. (stated ingredients)
6. Can you locate the dosage instructions?	Yes.	Yes.	Yes.
7. Do you understand these dosage instructions? Can you find which dosage you personally would take?	Yes. 1 pill in 24 hours.	Yes. I would take 1 pill in 24 hrs.	In 24 hours i'd take 1 pill.
8. Is there anything that could have been done to make the dosage instructions more clear to you?	no! they are in 2 places	nope.	No. It was understandable.
9. Can you locate the expiration date and read it aloud for me?	Yes. 07/2019	Yes. 07/2019	Yes. 07/2019
10. Can you find how many tablets come in the package?	7	7	7
11. How long should this product last you if you were to take it everyday based off of your personal dosage?	a week	7 days	7 days
12. Can you find a product description on this box?	Yes.	yes.	Yes.
13. Where are the warnings found? Are they clear and easy to understand?	in the pocket	on the paper in the pocket	on the foldable paper
14. What number should you call if you have any questions, comments, or concerns?	call 1-800-633-1610	call 1-800-633-1610	call 1-800-633-1610
15. Where do you store this product?	between 20-25 degrees	between 68-77 degrees Fahrenheit and 20-25 degrees celsius.	between 68-77 degrees Fahrenheit

Figure 3.2b. Summary test sheet from interviews about the redesign (Peyton Kelly, junior 2017).

Figure 3.2c. Revised design and information for Xyzal allergy medicine (Peyton Kelly, junior 2017).

Figure 3.3a. Original packaging and information for Kirkland's Non-Drowsy *AllerClear* Allergy medicine.

MEDICINE PACKAGING SUMMARY TEST SHEET
AllerClear Medicine Redesign

	Gail Griswold	Andrew Shalat	Christina Boladian	Implications for changes
Question 1 How often do you take medicine and interact with medicine packaging?	✓	✓	✓	Not often, only when sick so user experience should be straight forward.
Question 2 What is the name of this medicine?	✓	✓	✓	Clear title in front, not a fan of the typography choices used.
Questions 3 Have you ever used this brand of medicine before?	X	X	X	No participants have.
Question 4 What is this AllerClear used for?	✓	✓	✓	Subtite tells user what medicine is used for. Participants quickly knew
Question 5 How often do you take AllerClear?	✓	✓	✓	Front says take every 24 hours. Clear but doesn't mention how many to take.
Question 6 What is the minimum age for users to take AllerClear?	✓	✓	✓	Says in warnings, took participants longer than expected to find.
Question 7 Can you take AllerClear if you are pregnant?	✓	✓	✓	Says in warnings, took participants longer than expected to find.
Question 8 Are the warnings and instructions clear and legible?	X	X	✓	Says in warnings, took participants longer than expected to find.

MEDICINE PACKAGING SUMMARY TEST SHEET
AllerClear Medicine Redesign

	Gail Griswold	Andrew Shalat	Christina Boladian	Implications for changes
Question 9 When can you not take AllerClear?	✓	✓	✓	Warnings are labeled and confined in one place.
Questions 10 Overall, what is your opinion of the instructions?	X	X	✓	Too small and lack of hiearchy. Would be better with bullet points and seperate from other instructions.
Question 11 What design and legibility aspects do you like of the packaging?	X	X	✓	Not much, need to change typeface. Colors and design doesn't make participant wantto buy product.
Question 12 What do you like and prefer from other medicine's packaging?	✓	✓	✓	Less information, more confined to find instructions more easily.
Question 13 What is the most convenient type of packaging for on-the-go medicines, i.e. medicine packaging you take with you in your purse? Or keep in your car?	✓	✓	✓	Small containers that fit in pockets. Pop-out packets or small advil containers. Don't like the sound of rattling however.
Question 14 Is there any other feedback you would like to talk about that I have not brought up yet?	✓	✓	✓	Says in warnings, took participants longer than expected to find. Want packaging to almost be more plain. Open up packaging to make it more clear as a metaphor for clear sinuses.

Figure 3.3b. Summary test sheet from interviews about the original product (Megan Chovanec, junior 2017).

MEDICINE PACKAGING SUMMARY TEST SHEET
AllerClear Medicine Redesign

	John Chovanec	Ashley Volz	Julie Nixon	Feedback
Question 1 How often do you take medicine and interact with medicine packaging?	✓	✓	✓	Not often, only when sick so user experience should be straight forward.
Question 2 What is the name of this medicine?	✓	✓	✓	Clear title in front, not a fan of the typography choices used.
Questions 3 Have you ever used this brand of medicine before?	X	X	X	No participants have.
Question 4 What is this AllerClear used for?	✓	✓	✓	Subtitle tells user what medicine is used for. Participants quickly knew.
Question 5 How often do you take AllerClear?	✓	✓	✓	Front says take every 24 hours. Interviewees knew right away.
Question 6 What is the minimum age for users to take AllerClear?	✓	✓	✓	Says in warnings, found easily.
Question 7 Can you take AllerClear if you are pregnant?	✓	✓	✓	Says in warnings, found easily just like in previous question.
Question 8 Are the warnings and instructions clear and legible?	✓	✓	✓	Yes, color coded titles helped find information more quickly.

MEDICINE PACKAGING SUMMARY TEST SHEET
AllerClear Medicine Redesign

	John Chovanec	Ashley Volz	Julie Nixon	Feedback
Question 9 When can you not take AllerClear?	✓	✓	✓	Warnings are labeled and confined in one place.
Questions 10 Overall, what is your opinion of the instructions?	✓	✓	✓	Clear instructions, different colors help with hierarchy
Question 11 What design and legibility aspects do you like of the packaging?	✓	✓	✓	Liked the interactivtity of the booklet. Nice and cohesive
Question 12 What do you like and prefer from other medicine's packaging?	✓	✓	✓	Concise information. Small and can take around with user.
Question 13 What is the most convenient type of packaging for on-the-go medicines, i.e. medicine packaging you take with you in your purse? Or keep in your car?	✓	✓	✓	Small containers that fit in pockets. Pop-out packets or small advil containers. Don't like the sound of rattling however.
Question 14 Is there any other feedback you would like to talk about that I have not brought up yet?	✓	✓	✓	Pill pockets could be easily thrown away. Try to make sure information is elsewhere in case pill pocket is no longer attached to medicine.

Figure 3.3c. Summary test sheet from interviews about the redesign (Megan Chovanec, junior 2017).

Figure 3.3d. Revised design and information (Megan Chovanec, junior 2017).

the dosage and symptom reliefs written on the front so users could find the information quickly without any visual congestion on the packaging. The most important information was written on the back of the main packaging with a clear hierarchy in the instructions.

5.1 Of note…

Although some students lacked methodology and a thorough design process, their work nevertheless showed potential. It is important to remember that this was an introductory information design course. Although the following students did not master the methodology or required documentation, the following examples demonstrate how the application of information design principles can influence and contribute to an undergraduate graphic design program. There were a few solutions in the class that deserved merit in their commitment to solving a design problem utilizing qualitative methods and user-testing for the first time at an undergraduate level.

Rembold approached the packaging scenario with a key chain solution. Once the folded package was opened, the pills were revealed and could be popped out to the other side with pressure. The dosage information and warnings were included as two separate panels. The secondary packaging that would hold the key chain medicine pack included the same information but the type was larger and contained the uses of the product, as well as other information that was not a crucial element on the individual key chain packaging.

Stigna responded to one of the comments in the initial interviews regarding distrust of a generic brand in over-the-counter medication. *Signature Care* is under the brand Safeway, a popular convenience chain store that sells everything from soda to shampoo. *Signature Care* defined their healthy line of products as "effective, affordable wellness products that help you live a healthy life." Safeway also hosts sub-brands including *Signature Kitchens*, *Signature Farms*, *Signature Homes*, etc. One of Stigna's participants, in particular, did not feel comfortable taking medication from a brand that they did not recognize and trust. Stigna addressed the issue by creating a secondary, proprietary brand for *Signature Care*'s allergy medicine called *Allergo*.

Figure 4a. Original packaging and information for *Claritin's Non-Drowsy 12-hour Allergy* medicine.

Figure 4b. Revised design and information (Rebecca Rembold, junior 2017).

Figure 4c. Original design and information for *Signature Care's Allergy Relief*.

Figure 4d. Revised design and information for *Signature Care's Allergy Relief* (Eric Stigna, senior 2017).

6. Conclusion

6.1 Implications for design education and practice

The Introduction to Information Design course is only 1 of the 26 required courses in our graphic design BFA curriculum. Most of the graphic design required courses range from packaging design to motion graphics, advertising to book arts, typography to 4-D design, and so on. The program is heavily cemented in a traditional curriculum preparing students for work in design studios and ad agencies. In many ways the information design course is not only the beginning of understanding evidence-based design practices but also the end. I have had a few undergraduate students interested enough to continue this kind of work with me as independent study, working on a capstone project focused in evidence-based work, but that interest has equated to a total of five students in the past eight years. It is also important to note some of the feedback I have received (anonymously) from the students on this course specifically. On average, of all the classes I teach, this is the class in which students earn the fewest number of A's overall (less than 20%). Yet every year, students leave the class more self-aware of themselves as designers and with a better understanding of the role of measurable outcomes in design work. Students' unsolicited feedback of note:

- *I loved all the projects—they were all unusual projects that I never thought would be given to us. I especially liked the medicine packaging. I learned how to conduct research efficiently* (2015).
- *Would have liked more theory on cognitive psychology* (2015).
- *Loved the projects. It was challenging! But in a good way* (2016).
- *This class made students really think about information design in a complex way that I really respected* (2017).

A rare few could not see the use of information design and how it challenged their perceptions of the graphic design industry and commodity culture. This can be seen in this student's comment, "*I think it was a waste because it has no real world application and therefore it is not portfolio worthy*" (2016).

The relevance of this project becomes evident in our annual assessment of the program. We require all BFA seniors to be evaluated by external reviewers at a portfolio review hosted by Chapman University and the American Institute of Graphic Arts (AIGA)—United States' most prominent graphic design association. Between 40–60 professional designers, art directors, design faculty from art schools and public universities, agency principals, etc. from all sectors of the field and all areas of expertise attend the event to review the students' portfolios. External reviewers complete a rubric provided to them and assess how our near-graduates are performing. For the past five years, the medicine packaging project has consistently been noted as a "Chapman project" by these reviewers. This is due to the project's thoroughness, application of research and benchmarking. It is also due to the fact that we are the only undergraduate program that includes an evidence-based design project at this level of advocacy. This project offers Chapman graduates a unique perspective in a highly competitive supply of graphic designers in Southern California.

I believe that most undergraduate design programs in the United States do not assign projects like this for these three reasons:

1) Difficulty in breaking away from the traditional graphic design curriculum model

When I review other graphic design programs, the majority follow the same 4-year plan that includes classes with a generalist model. These models include

classes in drawing, basic design principles, motion, packaging, web, color, 3-D, typography, software training, etc. With the exception of typography and design studio (which usually has at least 3 levels of requirements—introduction, intermediate, advanced), there is usually only enough room in the curriculum to offer 1 or 2 specialized courses, such as information design. There is expectation and pressure from the curriculum for undergraduate students to create a portfolio in preparation of obtaining a design position in a design field that does not require evidence-based outcomes for design work.

2) Undergraduates pursuing graduate degrees

Graduate school is where specializations in design and investigations of design methodologies are emphasized and nurtured. At Chapman University, roughly 300 graphic design students have graduated in the past 12 years, however only 5 of those students have pursued graduate degrees. Our alumni thrive in their professional endeavors as graphic designers and stay in the industry. Pursuing graduate school has not been adopted in the culture of undergraduate graphic design professional degree programs which is driven by serving business needs and commercial commodity culture.

3) Skillset of the faculty

Of those who do pursue graduate degrees and most likely become design teachers, few focus on information design. Hiring faculty that are knowledgeable in the definitive approach to information design principles and evidence-based design is challenging.

My wish is for a culture shift in the undergraduate graphic design curriculum. The curriculum should address the changing and evolving complexities of the professional design landscape. The traditional graphic design curriculum should reprioritize objectives that emphasize specializations and that teach information design principles based on advocacy. Evidence-based design standards should become a fundamental requirement in graphic design undergraduate programs, with more frequency, support, and consistency throughout the curriculum.

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About the author

Claudine Jaenichen is an associate professor of graphic and information design in the Art Department at Chapman University. She serves on the executive board of the International Institute of Information Design (IIID), executive board for the Design Network for Emergency Management, and board of governors for the Communication Research Institute. Her work has been published in over 10 national and international journals and books.

Email: jaenichenstudio@yahoo.com