

Increasing Patternmaking Students' Understanding of Measurement Methods and the Relationship between Body Measurements and Sizes: An Assignment Design

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Patternmakers must understand types of measurement and how to measure accurately to develop technical skills to perform their role in the apparel and textile industry (Bye, Labat, & Delong, 2006). Therefore, it is vital that design students understand the technical process to achieve accuracy in measurements. There is also a wide variety in terms of how individual manufacturers correlate body measurements with sizes (Kinley, 2003). It is important for students to be aware of these variations in the naming of sizes. To increase patternmaking students' understanding of measurement methods and the relationship between body measurements and sizes, an innovative measurement and sizing assignment was developed for a flat patternmaking course in Spring 2015. This assignment included facilitating student learning about three types of measuring processes: (1) body scanning measurements, (2) personal (human form) measurements, and (3) dress form measurements. The purpose of this assignment was for students to (a) learn proper measurement techniques for human measurements and dress forms, (b) become aware of 3D body scanning technology, and (c) understand industry sizing label systems in comparison to personal measurements.

The course instructor delivered a Power Point lecture to the class on types of measurements, how to take measurements required for sloper pattern drafting, and the relationship between body measurements and sizes. The instructor demonstrated on a dress form how to mark key landmarks and how to use a measuring tape to take each measurement required to draft a sloper set. Students were taught how measurements extracted from a 3D body scan depend upon the set of rules or "measurement extraction protocol" (MEP) that the software is programmed to use. The use of different MEPs can result in a different measurement, even though the name of the measurement (e.g. waist) may be the same in both MEPs. The pros and cons of measuring with a measuring tape versus a 3D scanner were discussed.

Students were scanned with a [TC]<sup>2</sup> NX -16 3D full body scanner in the second week of classes. Measurements were extracted and provided to students as a PDF file. Students paired up with a partner to practice measuring the human body and documented these measurements using a Personal Measurement Chart (Joseph-Armstrong, 2010). Finally, students measured a dress form that was assigned to them based on the similarity of their personal body measurements to the dress form and recorded these measurements on a Form Measurement Chart (Joseph-Armstrong, 2010). As a final step, students wrote a report to cement their learning from all the components of this assignment. For this report, students (a) compared the three different types of measurements (body scanning, personal, and dress form), discussed which measurement system they believed to be most accurate, and explained their point of view; (b) downloaded the size

chart of their favorite brand and compare those measurements to their own and the size they typically wear; and (c) compared their personal measurements to those of the dress form measured. The components of this assignment were designed with the intention of increasing student knowledge of measurement and sizing.

Learning proper measuring techniques and understanding the relationship between measurements and sizes is vital to continued success in patternmaking. As a result, students' reports were used to determine the effectiveness of the strategy in fostering desired learning outcomes. The assignment was successful in meeting these goals as demonstrated by this quote from a student's report:

When comparing my measurements to the Dress Form size 20, the measurements were close; I usually wear a pant size 18. The measurements were no more than a couple inches different. In person my body looks a lot different that the form since I have had children and my body is not in perfect proportion. The body form was in perfect proportion and easier to measure than the body. I know when I measured my partner it was harder to do to find the landmarks and it was harder to find the perfect center and waist. I would much rather measure the forms if I was given a choice.

Students also demonstrated the effects of this knowledge throughout the remainder of the course. Students used the form measurements recorded on their Form Measurement Charts (Joseph-Armstrong, 2010) to draft basic slopers, which were later used to develop original pattern designs. When a pattern muslin did not fit, they checked the measurements used and re-measured their forms as needed. These experiences served to reinforce their understanding of the importance of accurate measuring. Students also learned about the variety of relationships between body measurements and sizes used in the apparel industry

Another interesting observation was that students seemed to grasp the meaninglessness of size designators. They understood that a size 6 in one brand of form may be a size 10 in another. Perhaps this is an unintended benefit of teaching in a classroom with forms from a variety of years and companies (Wolf, Alva, and other) in a variety of sizes. This assignment will continue to be used in the course. It is an essential part of setting students up for success in a patternmaking course.

#### References

- Bye, E., Labat, K. L., & Delong, M. R. (2006). Analysis of body measurement systems for apparel. *Clothing and Textiles Research Journal*, 24(2), 66-79.
- Joseph-Armstrong, H. (2010). *Patternmaking for fashion design*. Upper Saddle River, NJ: Pearson Education/Prentice Hall.
- Kinley, T. R. (2003). Size variation in women's pants. *Clothing and Textiles Research Journal*, 21(1), 19-31.