Incorporating big data analytics into graduate and undergraduate curriculum: A needs assessment

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Introduction Empowered by the Internet and computing technology, people nowadays leave huge amounts of digital traces that aggregated as "Big Data", when they make consumption decisions, conducting daily business, and maintaining their social connections. In retail industries, a growing number of companies rely on analyzing big data analytics to assist business decision making (Farooqu, 2016). Specifically, apparel retailers started to use big data regarding materials, design elements, body shapes (e.g., 3D body scanned data), and consumer feedback for trend analysis, consumer behavior analysis, forecasting, etc (Jain, Bruniaux, Zeng, & Bruniaux, 2017). The use of big data analytics may help retailers provide more accurate and personalized product and service offering, optimizing conversion rates across channels, and ultimately, achieving higher customer satisfaction (Greene, 2018). Retailers are expecting their employees to embrace and to adapt to the rise of big data analytic and its impact that shifted paradigm of business operation. While many disciplines may directly lead students to big data related career paths, such as statistics, data science, computer sciences, and management information systems (Ryoo, 2016), apparel merchandising careers may encompass the use and interpretation of big data analytic results. However, rarely have big data analytics been incorporated in the higher education in apparel related merchandising and retail programs. The purpose of this study is to conduct a needs assessment for including big data analytic components in the graduate and undergraduate curriculum of apparel merchandising and design programs and other human sciences programs. Specifically, we aim to find out (a) what type of contents related to big data analysis are lacking in the current curriculum in the above-mentioned programs, and (b) what types of contents are needed for students to be competent in the retail industries and other related fields.

Methods Data for this current study were collected by face-to-face interviews conducted in person or via a video conferencing service, Zoom. Each interview lasted about 30 minutes to 60 minutes. The researchers recruited undergraduate academic advisors, directors of graduate education, and scholars who conduct big-data related research in a large Midwestern University, across several human sciences programs, including apparel merchandising and design, education, human development and family science. This pool of participants was selected because they have the best knowledge in the curriculums, experience with advising student internships and job placement, expertise in most current big data analytics. The participants were asked about the impact of big data in the industry and their respective research areas, the essential skills that are

needed to be included in a big data analytic course, and how and where such a new course will fit into their current curriculum. The interviews were recorded and transcribed for a qualitative open-coding process for emerging themes.

This study is currently in progress. The authors have conducted four interviews, scheduled two more, and are continuing recruiting/reminding potential participants to participate. While conducting the interviews, the researchers also asked the participants to refer industry contacts as potential participants for a second phase of the study that addresses the research goals from the industry's perspective.

Findings and Discussion Despite the data collection is still in progress, several themes have emerged from a preliminary data analysis. First, all participants emphasized the importance of the skills for interpreting big data analysis results. Even though not all the students may need to perform data analyses themselves in their career, participants agreed that most students will need to interpret the results and make decisions based on the results. Therefore, the skills to accurately interpret results are essential. Second, participants suggested that students should learn to apply the big data analytic skills to solve real world problems. For many statistical course, the instructors and text-book authors may often simplify the examples in hope to make the "dreadful" analysis rationale and steps easier to understand. However, this common practice, if used excessively, may also make the examples irrelevant to students' daily life and to the complex scenarios in the industries. Lastly, participants considered basic statistic courses that cover concepts regarding statistical hypotheses testing, regression, and ANOVA should be prerequisites for a graduate level big data analytic course, because most big data analyses are essentially statistical analyses. One participant specifically spoke about students' knowledge in using syntax-based statistical software, such as R, should be expected before taking a big data course. Due to the large amount of data, researchers often need to perform analyses for big data on high performance computers that only allow syntax-based statistical software or programming languages, such as Python.

Implications and Future Research Based on the results from our preliminary data analysis, the partnership between educators and industrial contacts may be especially helpful for providing relevant and applicable examples that enhance skills for result interpretation. It should be noted that current merchandising/retail curriculums have commonly included retail math courses, from which some data analytic concepts could be transferred to big data. These courses could serve as a starting point for introducing basic concepts related to big data analytics, such as data format, data sources, etc. They can be a bridge between the current course offerings to new big data specific course offerings.

References

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