

**Infant Simulators in the Undergraduate Curriculum:
A Technological Tool for Teaching about Parenthood**

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ABSTRACT. The purpose of this paper is twofold. It describes the use of infant simulators to teach undergraduates about the experience of parenting. It also examines empirical evidence of the use of the infant simulator among undergraduates enrolled in parenting courses at two universities. In particular, the evaluative evidence explores lessons learned about parenting from the caregiving experience, along with the role of duration of the simulation on caregiving performance, reported caregiving difficulty, and lessons learned about parenting. Data from 261 students enrolled in undergraduate parenting classes at two universities were used for the evaluation. Qualitative findings indicated that students learned these lessons about parenthood: (1) It is demanding, (2) It requires patience, (3) A parent must be selfless, (4) Parents lose sleep, and (5) Single parenthood is difficult. Duration of the simulation was significantly associated with specific lessons. The evaluation data indicate that the simulator experience is a valuable learning tool for undergraduate students.

Keywords: technology, parenting, simulator

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Traditional undergraduate students are exposed to a wide variety of course content that may be outside their realm of experience, making it difficult for instructors to convince students that course material is relevant to their personal and/or professional lives. This disconnect can occur for traditional undergraduate students learning about parenting at a time when they are not parents. Furthermore, even if students recognize the relevance of parenting course material to their future roles as parents or professionals, they may find it difficult to truly understand experiences of parents, leading them to stereotype or make judgements about the needs and experiences of parents. Various techniques can be used for teaching about parenting, such as lectures, panel presentations, and videos. While these teaching strategies may prove beneficial to students who are auditory and/or visual learners, they may be less effective for students who are kinesthetic or desire experiential learning opportunities. Even among those for whom these strategies fit their learning preference, the lack of experiential experience may not suffice in teaching students about the real experience and demands of parenting.

While curriculum requirements such as practicums/internships, observation assignments, and civic engagement assignments can provide students with experiential and kinesthetic opportunities to learn about the experiences and needs of parents, such opportunities are limited in their experiential and problem-based learning capacities. In these experiences, students assume professional, student-learner roles. They are not directly and personally gaining a lived experience of parenting and its associated demands. They can converse with, assist, and observe the parents, yet until they can experience parenting themselves, their knowledge and understanding of the demands of parenthood and relevance of the material they are learning is limited. We know of instructors who have required students in a parenting class to babysit a child in order to gain experience as a sole caregiver. Yet, even this experience provides a limited learning opportunity since the caregiving is typically only hours in duration and does not mirror the demands associated with caring for one's own child.

Fortunately, technology may serve as a tool for instructors of parenting when the goal is to increase awareness of the demands of parenthood, while also providing an opportunity for students to "walk in the shoes" of parents. The infant simulator is one technology that can be used in higher education to teach about demands of parenting through experiential learning. Lewis and Williams (1994) defined experiential learning as "learning from experience or learning by doing" (p. 5). On a basic level, caring for an infant simulator provides an experiential learning opportunity for students to learn about parenthood by "doing parenthood." Furthermore, as we discuss here, the infant simulator exercise fulfills several requirements for experiential learning (noted by *Italics*) previously proposed by Chapman, McPhee, and Proudman (1995, p. 243). Specifically, successful caregiving of the simulator requires navigation of one's roles and responsibilities while simultaneously fulfilling tasks associated with parenthood. This fosters awareness of the relevance of parenting course material ("*engagement in purposeful endeavors*") while also providing insight into demands encountered

by parents as they navigate various ecological settings, roles, and relationships (“*encouraging the big picture perspective*”).

Successful care of the simulator also requires full immersion in the caregiving experience by maintaining proximity to the simulator and responding immediately to the simulator’s needs in an appropriate manner (“*creating emotional investment*”). In addition, the experience is likely to expand one’s comfort zone, resulting in physical, emotional and/or social discomfort during the simulation (“*learning outside one’s perceived comfort zone*”) and providing opportunity for reflection by students on their own beliefs about parenthood, along with plans and readiness for parenthood (“*role of reflection*”).

Effectiveness of Infant Simulators as Teaching Tools

Infant simulators are often used in high school settings to teach adolescents about demands of parenting in an effort to delay parenthood; thus, the primary purpose in such a context is often pregnancy prevention. Many researchers have reported that caring for an infant simulator is associated with modification of adolescents’ attitudes about parenting. Specifically, caring for the infant simulator has been associated with the realization among adolescents that parenthood demands considerable time (Barnett & Hurst, 2004; Didion & Gatzke, 2004; McCowan, Roberts & Slaughter, 2009; Roberts & McCowan, 2004; Somers & Fahlman, 2001) and patience (McCowan et al., 2009; Roberts & McCowan, 2004).

The caregiving simulation was also associated with awareness of the consequences of parenthood for one’s future goals (de Anda, 2006; Didion & Gatzke, 2004; McCowan, et al., 2009; Somers & Fahlman, 2001), personal life (de Anda, 2006; Didion & Gatzke, 2004), finances (Barnett & Hurst, 2004), and sleep (Didion & Gatzke, 2004; Somers & Fahlman, 2001). Finally, researchers found that caring for an infant simulator was associated with a desire to postpone parenthood until after marriage versus raising a child as single parent (Didion & Gatzke, 2004; Roberts & McCowan, 2004).

While some researchers have documented the effectiveness of infant simulators as teaching tools among adolescents, others have not found such evidence. In particular, several researchers reported that caring for an infant simulator was not associated with a significant change in attitudes about parenthood on quantitative measures (Barnett, 2006; Fahlman, Somers & Baker, 2000; Somers & Fahlman, 2001; Somers, Johnson, & Sawilowsky, 2002; Tingle, 2002). Research involving quantitative and qualitative results indicate that not all learning can be assessed quantitatively. For example, Somers and Fahlman (2001) failed to find significant differences in attitudes from pre- to post-caregiving on quantitative measures. However, analysis of their qualitative data showed that the simulator experience taught students that parenting is demanding and time consuming and can interfere with one’s goals.

Furthermore, while Divine and Cobbs (2001) found no significant change in the numbers of children that students planned to have or their desired ages for parenthood after an eight-day simulator experience, they did find that students reported learning valuable lessons about

parenthood, including the effects on their education, careers, sleep, time, finances, and freedom. At the same time, other qualitative findings have produced contradictory messages about the effectiveness of infant simulators. Out and Lafreniere (2001) found that while students who cared for a simulator were more likely to identify examples of demands associated with caring for a child, they were not more likely than a control group was to report examples of how parenting affects finances or social life.

While research suggests that infant simulators are effective tools for teaching high school students about parenthood, we lack evidence about the usefulness of infant simulators as an instructional tool among a college population. Specifically, we lack knowledge about the value of infant simulators in teaching undergraduates about the lived experience of parenthood and, in particular, the demands of parenthood. According to Knowles (1980), “the readiness of an adult to learn is closely related to the developmental tasks of his or her social role” (pp. 44-45). Traditional undergraduate students, or young adults, are involved in multiple social roles which may include that of student, worker, child, partner, volunteer, and, less likely, parent. While some roles may be maintained from one developmental period to the next (i.e., child, student), undergraduate students are likely to possess social roles that are quantitatively and qualitatively different from those of adolescents. Knowles (1980) went further by asserting that teachable moments exist during developmental tasks. According to Erikson, young adults are emerging from the developmental challenge of creating their identities and embarking upon the challenge of establishing intimacy with another, during which “the serious romantic partner becomes important” (Pittman, Keiley, Kerpelman, & Vaughn, 2011, p. 39). While their social roles may not include that of parent, developmental tasks indicative of young adulthood may foster teachable moments with respect to the undergraduate’s focus on intimate relationships, which may involve future social roles (e.g., parent) evolving from such relationships. Therefore, given the importance of social roles and developmental tasks to learning (Knowles, 1980), the value of the infant simulator experience may differ for undergraduate students in comparison to high school students. Consequently, there is a need to explore the usefulness of the technology in higher education settings with undergraduate students.

In this paper, we describe our use of the infant simulator in undergraduate parenting classes. We also identify and discuss the lessons undergraduate students learned about parenting from the assignment as reflected in their reflections. Finally, to assist educators as they make decisions about the length of the caregiving simulation (length of immersion), we also discuss our findings regarding the length of the caregiving experience in relation to caregiving performance, the level of difficulty experienced during the simulation, and lessons learned about parenthood from the simulation. The paper explores these research questions:

- RQ1: Is there a significant difference in caregiving performance between the shorter and longer caregiving duration groups (i.e., length of immersion)?
- RQ3: Is there a significant difference in difficulty reported between the shorter and longer caregiving duration groups?

RQ4: What did the students learn about parenting from the simulator experience as reported in their reflections?

RQ5: Are there differences in the lessons learned about parenting between the shorter and longer caregiving duration groups?

Infant Simulator Caregiving Assignment

As described in this paper, the infant simulator assignment was used in undergraduate parenting courses taught by the same instructor at two universities (one in the south and one in the Midwest of the United States) during the academic years 2009 to 2016. All students enrolled in the parenting course at the southern university were required to care for an infant simulator for a 13-hour period during the quarter in which they were enrolled in the course. The students picked up the stimulator immediately after class, with the simulator programmed to turn on at 6 pm that evening and shut off at 7 am the next morning. Students enrolled in the course at the Midwest university were required to care for the infant simulator for a 42-hour period starting at 6 pm on Friday and ending at noon on Sunday. At both universities, students submitted their scheduling preferences and restrictions; the instructor assigned them to a date for the caregiving experience that reflected their preferences/restrictions.

Students at both universities were allowed to have the simulator set on “quiet” for a duration of time for work or other worthy purposes; however, they made up for the quiet time by starting the simulator earlier or later than the typical starting or ending time. Caregiving durations differed between the universities due to class size, term length, and number of available simulators. More specifically, it was not possible for students to care for the simulator for a longer period of time and only on weekends at the southern university due to larger class sizes and the shortened 10-week term. By contrast, the smaller class size and extended term length permitted students to care for the simulators for an entire weekend at the Midwest university. These differences in caregiving duration provided an opportunity to examine differences in performance and learning that may result from differences in the length of simulation.

The Reality Works Real Care Baby 2 was used at each university. Each simulator “was” a newborn (approximately 8 days old). Students were required to bottle feed, burp, rock, and change the diaper of the simulator during the simulation, as requested by the cries of the simulator. A tamper-proof wristband containing a programmed microchip was worn by students to ensure that only the student assigned to a given simulator could care for that simulator. The simulator would not respond to anyone who was not wearing the wristband specifically programmed for that particular simulator. Students were instructed to leave the wristband on until it was removed by the instructor when the student returned the simulator.

The infant simulator contained a processor that recorded the care students provided. Caregiving performance data was downloaded to the instructor’s computer after students returned simulators to the instructor. The simulator software program computed a *caregiving score* for each student ranging from 0 to 100. Scores were based on the percentage of caregiving

demands (i.e., burping, feeding, diapering, rocking) each student provided to the simulator within two minutes after the simulator began to “cry,” minus penalties for inadequate care provided by the student. Penalties were deducted from the student’s score for (a) shaking the simulator (15% deduction), (b) failure to provide head support (1% deduction), (c) rough handling (2% deduction), and (d) placing the simulator down to “sleep” on its “stomach” (1% deduction).

Before their caregiving experiences, all students attended a “parent education” session. Along with watching the Reality Works Real Care Baby video, they also practiced identifying and responding to the simulator’s needs. In particular, students practiced responding to the simulator in a timely manner without engaging in head support issues or rough handling, all of which would affect caregiving scores. This session was intended to mimic (albeit recognizably to a small degree) parent education classes that expectant parents attend before the birth of their child. The course instructor conducted each session with help from graduate and undergraduate teaching assistants.

On completion of the caregiving experience, each student wrote a reflection paper about his/her experience caring for the infant simulator. One requirement of this task that was useful to this study had each student rate, on a 1 to 10 scale (with 10 being the most difficult), the level of difficulty they experienced while caring for the simulator. This number served as the student’s *caregiving difficulty* rating for the study. Each student was also required to write a reflection paper in which they identified and discussed what they learned about parenting from the caregiving simulation in response to the following open-ended question, “What did you learn about parenting from the simulator experience?” Their responses to the open-ended question were used for exploring lessons students learned about parenting from the simulation experience.

Evaluation Methodology

Participants

The study used data from 261 students (245 females, 16 males) enrolled in an undergraduate parenting class during each academic year between 2009 and 2016. Over a three-year period data were collected from 139 students enrolled in a parenting class at a university in the southern region of the United States. Data were also collected over a four-year period from 122 students enrolled in a similar parenting class at a university in the Midwest. Fourteen students were parents, representing 5.4% of the total sample. Human Subject Approval was obtained at each university. One course was taught on a quarter system and the other on a semester system. Aside from the duration difference, course content was the same and the same instructor taught all the courses. At the end of the quarter/semester, an individual not involved in the research requested permission from students to use their simulator scores and reflection papers for the research project. Consent forms were collected and withheld from the researcher until after grades were submitted for the quarter/semester.

Results of Evaluation Component

The mean caregiving performance score for the sample was 89.49 (ranging from 26 to 100, $SD = 11.719$). The mean difficulty rating was 5.603 (ranging from 1 to 10, $SD = 1.765$). An independent sample t-test was used to test whether there was a significant difference in caregiving scores between students who cared for the simulator for shorter duration (13 hours) and those who cared for it for the longer duration (42 hours). While those who cared for the simulator for a longer duration earned slightly higher scores ($M = 90.23$, $SD = 9.832$) than did those who cared for the simulator for the shorter duration ($M = 88.9$, $SD = 13.156$), the difference between groups was not statistically significant: $t(252.78) = -.967$, $p = .334$. Supplemental ANOVA, used to control for participants' sex and parenthood status, produced non-significant results consistent with those of the independent sample t-test.

An independent sample t-test was used for determining whether there was a significant difference in care difficulty reported between students who cared for the simulator for the shorter versus longer duration. While those who cared for the simulator for the longer duration reported greater difficulty ($M = 5.728$, $SD = 1.768$) than did those who cared for the simulator for the shorter duration ($M = 5.507$, $SD = 1.764$), the difference between the groups was not significant: $t(237) = -.957$, $p = .339$. Supplemental ANOVA, used to control for participants' sex and parenthood status, produced non-significant results consistent with those of the independent sample t-test.

Content of the students' reflections on the question "What did you learn about parenting from the simulator experience?" were analyzed using open-coding. Specifically, given that this was an exploratory study, the primary investigator performed open-coding on the responses until saturation was reached to generate a coding scheme, which the primary investigator and another coder subsequently used for coding students' responses. Any discrepancies in coding were discussed until coders reached agreement. Overarching themes were then derived from the codes, with quotes chosen to represent themes. The following four overarching themes emerged from the analysis: (1) Parenting is a demanding job, (2) You have to be selfless when you are a parent, (3) You lose sleep when you are a parent, (4) Parenting requires patience, and (5) Being a single parent would be really hard.

"Parenting is a demanding job"

Overall, 216 of the 261 students (82.76%) wrote about the demands of parenthood in the reflection paper. In particular, they mentioned the attention, time, and energy demands involved in parenting. One student from the Southern sample wrote:

The number one thing I learned throughout this experience was that parenting is the toughest job out there and to top it off, it's free labor!...Being a parent takes a lot of hard work and dedication, and it is extremely time consuming. A parent needs to be prepared to devote if not all then most of their time to the baby (Participant 112).

Another student from the Southern sample, who noted the difficulty associated with meeting the demands of the baby and other responsibilities, wrote, “Parenting would be very difficult to balance with everyday life. I can’t imagine having a career and a baby. Parenting clearly takes a lot of energy, time, patience and compassion as well as the ability to adapt to the changes with everyday life” (Participant 94).

Students identified the importance of being flexible in meeting demands of parenthood. For example, a student from the Midwest sample noted:

[Before this experience] I did not fully appreciate how much flexibility a parent needs to have in order to care for a newborn. Every time you have something planned, you need to be able to change those plans as soon as your baby needs you, which is generally as soon as you begin a task. There were very few times during the weekend when I got things done exactly when I had planned to do them; the timing of other events were all dependent on his needs (Participant 200).

In addition to being flexible, the need to multi-task and prioritize were noted in relation to the demands of parenthood. In particular, one student from the Southern sample stated, “I learned that parenthood means prioritizing and realizing what needs to be done and what can wait until later” (Participant 103). Likewise, a student from the Midwest sample wrote, “You also need to be good at managing your time, planning things ahead and being one step in front” (Participant 221).

Subsequent chi-square analysis indicated a significant association between students identifying this theme and duration of the caregiving experience, $X^2(1, N = 261) = 5.233, p = .032$. Specifically, students who cared for the simulator for a longer duration (77.05%) were less likely to write about the demanding nature of parenthood than were those who cared for the simulator for the shorter duration (87.77%).

“You have to be selfless when you are a parent”

Overall, 76 of the 261 students (29.12%) wrote about the need to be selfless when you become a parent. In particular, students discussed how parents must put their own needs and desires aside and focus on their child’s needs. One student from the Southern sample stated, “I did not realize until this assignment that being a parent has to be a selfless act. Nothing revolves around the parent. Everything revolves around the child” (Participant 78). Similarly, a student from the Midwest sample stated, “You need to be completely selfless, you need to be 100% willing and okay with letting yourself take the backseat for a while” (Participant 221). While discussing the selflessness involved in parenting, students also discussed sacrifices parents make for their children. As one student from the Southern sample stated:

I learned how selfless a parent must become. Parents have to completely alter their schedules and lifestyles. If the baby needs to be taken care of when you would rather be sleeping – too bad. It almost takes away a sense of control in a way, because a parent is suddenly completely responsible for another person, and this person most likely will not be on the same schedule as you (Participant 108).

While not a predominant theme, students talked about the love involved in parenting, particularly in relation to the sacrifices parents made. This is illustrated by a student from the Southern sample who wrote, “I realized that parenthood is the most sacrificing job you can take. I learned that being a parent means giving up things that may mean a lot to you for someone who means more to you” (Participant 78).

Subsequent chi-square analysis indicated no significant relationship between students identifying the selflessness theme and the duration they cared for the simulator, $X^2(1, N = 261) = 1.493, p = .222$. Students who cared for the simulator for a longer duration (32.77%) were more likely than were those who provided care for a shorter duration (25.9%) to report that parenting involved sacrifice and selflessness. However, the finding was not significant.

“You lose sleep when you are a parent”

A total of 62 (23.8%) of the 261 students discussed the sleep loss/deprivation accompanying parenthood. In particular, they discussed how disrupted sleep affects a parent’s ability to function in other roles. According to one student from the Midwest sample,

As a parent, you also have to get used to not sleeping very much. The simulator went off twice during the night when I had it, but a real baby will be up more than that. Living on lack of sleep is not easy to do, especially if the parent is in college or has a job that they need to focus on, and it can reflect poorly on grades or your actual work (Participant 211).

Another student, this time from the Southern sample, noted how the simulator experience provided only a glimpse into the sleep deprivation parents experience: “I also learned how tired parents can become. I lost one night of sleep, but parents have to deal with their crying baby every night, while still trying to perform their daily tasks” (Participant 103). Finally, student responses indicated they recognized sleep loss does not result only from providing care to the newborn; it also results from changes in the way parents sleep. In particular, students discussed the need to be “light sleepers” in order to hear the baby cry during the night. This was noted by a student from the Southern sample who wrote, “I also suspect you sleep lighter when you know that the baby might cry” (Participant 63).

Subsequent chi-square analysis indicated no significant relationship between caregiving duration and students identifying this theme, $X^2(1, N = 261) = .082, p = .775$. Students who cared for the simulator for a shorter duration (24.46%) were slightly more likely than those who cared for it for the longer duration (22.95%) to discuss losing sleep; but, again, the relationship was not significant.

“Parenting requires patience”

A total of 103 students (39.46%) wrote about the need for parents to have patience. In particular, the students discussed the importance of patience in the midst of frustration. One student from the Southern sample noted, “I have learned that parenting takes a lot of patience. I

have learned that as a parent you cannot freak out when your child starts crying and screaming, but you have to keep your composure and deal with the situation calmly” (Participant 81). Students also discussed the need to be patient when caregiving tasks required extended time, as illustrated by this comment from a student from the Midwest sample: “As a parent, you can’t get impatient waiting for your child to finish eating. You really have to have patience to sit there and wait for them to be done feeding. If a parent does get impatient, they could get frustrated and then end up harming the baby” (Participant 211). As an aside, several students wrote about their surprise at how much time it took to feed the simulator.

Subsequent chi-square analysis indicated a significant relationship between identifying this theme and the caregiving duration, $X^2(1, N = 261) = 28.019, p < .001$. Results indicated that students who cared for the simulator for 42 hours (56.56%) were more likely to discuss the need for patience than were those who cared for the simulator for 13 hours (24.46%).

“Being a single parent would be really hard”

Overall, 42 of the 261 students (16.09%) wrote about realization of how difficult parenting is without a partner. One student from the Southern sample wrote, “The stress and frustration I experienced while trying to take care of the simulator on my own is very similar to what a single mom or dad probably goes through on a daily basis. Parenting is a wonderful experience that should not be left to one parent” (Participant 54). Another student from the Southern sample stated, “I now fully understand the old saying, ‘It takes a village to raise a child.’ No one person can deal with the stresses of a newborn alone twenty-four hours a day, day in and day out” (Participant 61). Finally, students also noted their newfound realization of the needs of single parents as a result of taking care of the simulator. For example, one student from the Midwest sample wrote, “I thought that single parents struggled, but struggle was not the word. Having the simulator alone for one night made me realize that single parents have their children alone every day and they are in dire need of help” (Participant 259).

Subsequent chi-square analysis indicated a significant relationship between students identifying this theme and the caregiving duration, $X^2(1, N = 261) = 5.014, p = .025$. Results indicated that students who cared for the simulator for 13 hours (20.86%) were more likely to report learning that single parenthood is difficult than were those who cared for the simulator for 42 hours (10.66%).

Discussion

Overall, students reported mid-level difficulty in caring for the simulator and performed relatively high on caregiving. Their overall success at caregiving may indicate that students took the experience seriously, since very few engaged in neglectful or damaging behaviors during their simulator experiences. Their performances may also reflect the fact that all students were briefly trained on providing care for the simulator during the “parent education” session before engaging in the simulator experience. It would be interesting to investigate whether caregiving scores are affected by the presence/absence of such training. However, we do recommend inclusion of “parent education” sessions to ensure adequate preparation for the assignment

among all students. We also included the session to mimic the experience of new parents who attend prenatal and parent education sessions.

There were no significant differences in the caregiving and difficulty scores with respect to caregiving duration. While those who cared for the simulator for a longer duration of time earned higher scores and reported more difficulty, these differences were very small and insignificant. Differences that did appear may suggest that over time, students gained more confidence and became more comfortable caring for the simulator, which may have played a role in their higher scores. This is opposed to students who had the simulator for only one night and may not have gained enough experience to “perfect” or enhance their caregiving skills before returning the simulator. By contrast, students who had the simulator for longer durations also reported slightly more difficulty in caring for the simulator. This makes intuitive sense because they had to balance more demands over longer periods of time and likely experienced more disruptions in their sleep and normal routines.

Overall, the simulation assignment appeared to have an impact on students enrolled in the courses. Our qualitative findings illustrated the potential of the infant simulator caregiving experience to raise awareness about demands of parenting among undergraduate students. In particular, the simulator experience helped students learn firsthand that parenting a newborn is a difficult job that demands time, energy, and undivided attention. They also gained awareness about the importance of patience and selflessness/sacrifice during the transition to parenthood, as parents must put their child’s needs first and remain calm in situations that produce frustration. Students also learned about disruption in sleep that accompanies parenthood, not just from providing actual caregiving in response to a child’s crying, but also due to the tendency to sleep “lightly” to listen for the child’s cries. Finally, the experience helped students realize that parenting without a support system is difficult. Students reported appreciation for the demands that single parents and classmates with children face, along with a desire to be involved in marriage or a partnership before having a child.

In general, the lessons the undergraduate students learned from the caregiving experience mirror those reported in other research involving adolescents in a high school context. The similarities, however, should not deter the use of the simulators in higher education with undergraduates. Rather, we argue that the assignment has value in secondary and higher education contexts. Despite the fact that some students who participated in our study had cared for a simulator in high school, they reported that this experience “was different.” During high school, they took the simulator to the house they shared with their family. However, very few of the students who participated in our study lived with their parents. In many situations, their roommates left for the weekend so as not to be bothered by the simulator’s crying. Therefore, our students were left to cook, clean, run errands, etc. with little or no tangible or emotional support while also trying to study and complete college-level assignments, all while tending to the needs of the simulator. Many also faced challenges associated with balancing the demands of caregiving with those of work and extracurricular activities.

Drawing on Knowles’ (1980) assumptions about adult learning, the differences in developmental tasks that high school and college students face may influence the caregiving

experience and what people learned from the experience. During adolescence, when people are questioning who they are and who they hope to be, caring for an infant simulator is likely to prompt consideration of the impact of parenthood on their aspirations (i.e., whom they want to become). By contrast, during the young adult years, when the developmental challenge centers on intimacy, caring for a simulator is likely to continue to involve consideration of the impact of parenthood on their aspirations. However, the young adult is also considering the caregiving simulation in conjunction with his/her relationships with others.

Returning to our use of the simulator, it was not uncommon for students to be involved in intimate or even cohabiting relationships when they completed the caregiving assignment. In fact, feedback from students indicated that the caregiving experience sometimes created tension in their intimate relationships indirectly (through stress-related behaviors) and directly (due to caregiving demands and differences in child-rearing goals and beliefs that became evident during the caregiving experience). For some, the simulation prompted reflection about the future of their relationships based on what they learned about their partners during the caregiving simulation. Such relationship issues and the emphasis on building/maintaining intimacy with significant others added a dimension that was not involved in the high school caregiving experience. Overall, the context of caring for the simulator was different as an undergraduate student, which, according to informal student feedback, made the experience more realistic and difficult than it was in high school.

Conclusion and Implications

Our evaluation provided insight on the usefulness and value of the simulator experience for undergraduate students, expanding existing empirical evidence beyond the secondary education context. Due to a change in the instructor's employment, we were also able to examine the usefulness of the simulators in varying levels of immersion (i.e., caregiving duration) under the same instructor. Based on our experiences and findings, the infant simulators appear to be a valuable technology for teaching undergraduates about the experience of parenting. Our quantitative findings did not clearly indicate that a longer caregiving simulation results in more learning; however, our qualitative findings provide some insight into the role of the duration of caregiving on the educational value of the experience. Students who cared for the simulator for the longer duration (42 hours) were more likely to write about the importance of patience for parents, while students who cared for the simulator for a shorter duration (13 hours) were more likely to note demands associated with parenting and the difficulty associated with single parenthood.

Students in both duration groups were similarly likely to report on loss of sleep and sacrifices involved in parenting. Therefore, our findings indicate that learning occurred regardless of caregiving duration, yet there were significant differences in the likelihood of particular lessons learned. While a longer duration obviously gives students more opportunities for experiential learning (through more hours of hands-on caregiving) and more opportunities to problem-solve as they attempt to identify and tend to the simulator's needs while balancing their needs with those of the simulator, a longer duration is not always possible due to limited time and resources. Fortunately, our findings indicate that a caregiving simulation of shorter duration

also provides a valuable learning experience for undergraduate students. Thus, even in cases of limited time and resources, infant simulators appear to be a valuable technology for experiential learning in undergraduate parenting classes.

Although our study provides insight into the usefulness and promise of infant simulators in higher education, instructors considering the use of infant simulators in their own classes should recognize the limited generalizability of our evaluation findings. The students enrolled in the classes and included in the evaluation represented a homogenous group, with most of the students being female and Caucasian and relatively few of the students being parents. Thus, the caregiving experience may have different impacts on a less homogenous student body with regard to race, gender and parenting status. We encourage continued use of the simulators at the undergraduate level, along with additional Scholarship of Teaching and Learning (SoTL) research on their effectiveness, to provide further evidence of the value of the simulators as experiential teaching tools with students enrolled in undergraduate programs.

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