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ORIGINAL RESEARCH ARTICLE

Improving student and faculty communication: the impact of texting and electronic feedback on building relationships and the perception of care

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Students perceive care as a quality of highly effective faculty, and building positive relationships is essential to a successful college experience. However, many college students report never having developed caring relationships with faculty. We propose faculty have an opportunity to use technology to help build caring relationships in an effort to improve overall academic success. The majority of research on student–faculty interaction has primarily focused on determining what kinds of interactions students have with faculty. The aim of this study was to explore students' perceptions of care and the role safe texting and electronic feedback played in building student–faculty relationships. A mixed-methods approach was used with college student participants (n = 307) to answer the following research questions: (1) What actions by faculty constitute "caring"? (2) What role does technology play in students feeling "cared for"? The findings indicate that safe texting platforms and electronic feedback had a positive impact by increasing accessibility and direct contact.

Keywords: technology; care; relationships; higher education; texting; feedback

Introduction

Over the last two decades, technology has transformed many aspects of our culture, including education. Many classrooms are equipped with smart technologies, and students are commonly required to bring devices to class to enhance the learning experience (Wong 2008). However, devices are often seen as a barrier to interpersonal relationships. There is little research on student perceptions of how faculty can use technology to demonstrate care and build relationships. Building positive relationships is essential to a successful college experience. In fact, there are few factors in education that have a stronger impact on education than positive student–faculty relationships, including academic achievement and satisfaction (Noddings 2005; Rimm-Kaufman and Sandilos 2010). Students perceive care as a quality of highly effective faculty (Meyers 2009). The significance of the teacher–student relationship has been widely recognised in primary schools but not in higher education (Hagenauer and Volet 2014). We propose that faculty have an opportunity to use technology to help build caring relationships in an effort to improve overall academic success.

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This mixed-methods study investigated student perceptions related to faculty implementation of safe texting and electronic feedback designed to promote relationships and care. It sought to answer the following research questions from the students' perspective: (1) What actions by faculty constitute "caring"? (2) What role does technology play in students feeling "cared for" (Noddings 2005)? It furthers the literature on student–faculty interaction, examining the role technology can play in such interactions.

Theoretical framework

The theoretical framework for this study rests on Noddings' (1992, 2005) ethics of care in the classroom that argues care should be at the heart of the educational system. This theory states academia places too much focus on data-based achievement. Institutions are held accountable for student results to demonstrate effectiveness. There is not enough emphasis placed on the development of the individual student and the importance of relationships. The ethics of care theory does not deny students should learn the knowledge and skills necessary to help them be productive caring citizens, but, rather, calls on faculty and institutions to be responsive to students' diverse needs and backgrounds, new and evolving technologies, and the environment. According to Noddings (1984), there are two parties in a caring relationship 'the carer and the cared-for.' In this study, like many school settings, the role of carer is assumed by the faculty member and students are the cared-for. Noddings (2005) provides four key components of care: modelling, dialogue, practice and confirmation. Noddings (2002) argues, 'Caring about is empty if it does not culminate in caring relations', and thus, the carer must receive and acknowledge the care in order for a caring relation to occur (p. 24). This study's theoretical framework focuses on modelling where faculty, the carers, demonstrate caring actions with students, the cared-for, by using technology like texting to enhance communication and build relationships (Noddings 2005).

Literature review

Why care matters

When students feel 'cared for' by a faculty member, they work harder academically, exhibit more confidence, and demonstrate higher levels of engagement, academic performance and overall development (Addison 2012; Ceylan *et al*. 2012; Nadge 2005; Noddings 2005; Velasquez, Graham, and Osguthorpe 2013). The development of supportive student–faculty relationships in the classroom can also encourage students to be more invested in their learning (Kim and Lundberg 2016; Meyers 2009; Tatum *et al*. 2013).

Students frequently list care as a quality of effective faculty (Meyers 2009; Noddings 2005). Lowman (1994) divides the qualities of effective teaching into two dimensions: instructional excitement (such as content knowledge, preparation and clarity) and interpersonal rapport (such as care, availability and respectfulness). Students place a higher value on rapport-based roles than faculty (Buskist *et al*. 2002). Although some faculty offer criticism towards dedicating time to building rapport, such as time constraints, generational disrespect, class sizes, appropriate boundaries, and lacking academic rigor (Meyers 2009), one-on-one time can make students

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feel faculty respect and care for them (Kim and Sax 2017). Personal connections can strengthen students' engagement, and students are more likely to verbalise the help they need once they have made a personal connection (Kim and Lundberg 2016; Strong, Silver, and Robinson 1995).

Students notice when faculty do not appear to care (Feldman 1988; Noddings 2005; Meyers 2009). Care is relational, and as Hawk and Lyons (2008) found, when faculty do not demonstrate care, students do not demonstrate care in return. Caring teachers intentionally model caring actions with their students (Noddings 2006). Caring teachers do not pretend to care; they truly do care about their students' well-being and success in the classroom, fostering a positive classroom climate (Noddings 2006). Classroom climate plays a significant role in higher education; Graham and Gisi (2000) found it to be the best predictor of students' overall satisfaction with their college experience. In general, students prefer courses that have a supportive and positive classroom climate (Barr 2016).

Technology and relationships

As technology evolves, so does its impact on relationships and education, and most faculty have the option to utilise technology as a tool to positively impact academic achievement, attendance, motivation, engagement and communication. Today's college students (18–23) are cited as addicted to technology and have never known a world without it (Roberts, Yaya, and Manolis 2014). They seem to enjoy being a part of a hyper-communicative world, always connected to each other and their resources (Roberts, Yaya, and Manolis 2014; Skiba 2014). College students express higher stress and anxiety when they do not have their devices in close physical proximity (Panova and Lleras 2016; Roberts, Yaya, and Manolis 2014).

Most research in this area, however, has been surrounding the use of technology in the classroom. This study proposes to add to the literature by focusing on student perceptions of how faculty from various disciplines in a face-to-face environment used technology to support relationships congruent to the classroom by creating meaningful avenues of communication and providing electronic feedback.

Creating meaningful avenues of communication is vital in developing relationships (Chickering and Ehrmann 1996). However, in the changing landscape of education, faculty may need to consider less traditional means of communication (Carr 2016). Faculty first need to identify the ways in which they can best communicate with their students. Castleman (2015) reports that alternative methods of communication, such as safe texting and virtual conferencing, can enhance a student's collegiate experience.

In the early 2000s, email changed the communication landscape. But, almost 20 years later, there are many alternatives for students to choose from to communicate with each other (Alakurt 2019). According to the 2014 Gallup poll, texting is the preferred communication tool for people under 50 years old. For faculty, 1:1 texting maybe too much of a personal communication leap; however, free safe texting services like Remind and GroupMe offer privacy by blinding users' personal phone numbers and documentation, while offering an additional way to relay course information or check in with students.

Additionally, providing quality feedback is a well documented factor in student achievement and success (Dean *et al.* 2012; Hattie and Yates 2014), and how students receive feedback is critical to their learning (Sopina and McNeill 2015). Technology has

created myriad platforms to provide electronic written, audio or video feedback, including Kaizena, Jing and LMS integrations. There is a wealth of research surrounding the differences in student perceptions of traditional and electronic feedback (Bayerlein 2014; Mayhew 2018; McCarthy 2017; Irwin 2018; Lefevre and Cox 2017; Spitzer *et al.* 2012). Students tend to appreciate timely, quality feedback and place a higher emphasis on numerical grades. Several studies indicate that students appreciate electronic feedback because of its immediacy and its economic and environmental benefits (Bayerlein 2014; Sopina and McNeil 2015; Ryan, Henderson, and Phillips 2019; Walter, Ortbach, and Niehaves 2015). However, it is important to note that electronic feedback does not guarantee quality feedback.

Materials and methods

Participants

Convenience sampling was used to identify eight faculty members at a private, liberal arts college in the Mid-Atlantic region of the United States. Using Nodding's (2005) modelling of the cared-for as a framework, the faculty were invited to attend a technology-focused professional development training focused on three strategies that model caring actions: multiple communication methods, modelling an online presence and providing feedback to use technology to support the student–faculty relationship. During the training, faculty explored various technology tools, apps and websites related to the three strategies, including Remind, GroupMe, Screencast-o-matic, Jing, Kaizena, Google Voice Comments and various social media platforms, such as Facebook, Instagram, Twitter and LinkedIn. After the training, faculty were invited to participate in the study. Participating faculty agreed to (1) integrate at least one of the training strategies in a course for one semester, (2) disseminate a voluntary perceptions-based survey at the end of the semester and (3) complete a personal perceptions-based survey at the end of the semester. Of the eight faculty members who attended the training, six agreed to be a part of the study. Faculty participants were from varied disciplines, including Mathematics (1), Science (1), Communication (2), Literature (1) and World Languages (1). Several faculty chose to implement the strategies in multiple courses; therefore, 15 courses were included in the study. All participating faculty members implemented at least one of the strategies. Two-thirds implemented all three strategies for one academic semester. For the purposes of this study, the 307 undergraduate students enrolled in the 15 classes taught by these 6 faculty members are identified as the participants.

Design and data collection

This study employed a mixed-method design; the primary data were collected from a 23-item survey and individual interviews. This design was selected in order to triangulate multiple data sources to better ensure reliability and validity of the data (Creswell 1998). An expert panel assisted in reviewing survey and interview questions with 81% content validity.

The United States Department of Education's National Center for Educational Statistics has prioritised research on school climate in order develop policies on effective school practices. The Education School Climate (EDSCLS) survey series is a public survey available for use by any school seeking feedback from its

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stakeholders. The survey was streamlined for this study and only included questions related to engagement, safety and environment. Using Google Forms, the survey was distributed via email to all student participants. Nineteen of 23 questions were analysed to address the study's research questions. The remaining questions are being used for a follow-up study.

Students who completed the survey were contacted to participate in a 30–45 min individual interview. Interviews were held at the end of the semester; 11 interview questions were developed by the lead author and included a mix of open-ended and closed questions. Seven open-ended and one closed questions were analysed as the primary data sources to address the study's research questions. The remaining questions are being used for a follow-up study.

The interviews were designed to elicit information about students' opinions on the perception of care by the faculty and the faculty's use of communication and feedback technologies. Interviews were audio-recorded by the lead researcher and transcribed by a professional transcription service: Eword Solutions. For the majority of participants, no relationship was established prior to the study, and the researchers' personal goals or reasons for conducting the study were not revealed. No feedback regarding the interviewer characteristics was elicited, and transcribed interviews were not returned to participants for feedback.

Data analysis

According to Noddings (2005), faculty members, the carers, demonstrate caring actions with students, the cared-for, by using technology like texting to enhance communication and build relationships. Noddings (2002) argues, 'Caring about is empty if it does not culminate in caring relations', and thus, the carer must receive and acknowledge the care in order for a caring relation to occur (p. 24). Fifteen course sections were included in this study; all 307 students (100%) enrolled were asked to complete the online survey at the end of the semester related to their experiences and perceptions about caring relationships and technology. Of those, 198 students (64%) participated in the survey. Students who completed the survey were then asked to participate in a follow-up interview. Of those, 45 students (15%) participated. Transcripts were analysed by two of the authors (JC and KSR) using a thematic approach to identify caring actions modelled by the faculty, carer, as emergent ideas and concepts received by participants, the cared-for, using content analysis (Noddings 2005; Patton 2002).

The content analysis process required individually reading through the open-ended interview question responses and noting any potential emergent themes as caring actions (Noddings 2005; Miles and Huberman 1984). The researchers then reviewed potential themes and discussed redundancies and inconsistencies to formulate a finalised list of 10 modelled caring themes.

Using these themes, two researchers individually coded all open-ended responses for a singular theme. Upon completion, the researchers reviewed the codes and discussed any that did not align until a consensus could be reached.

Mixed-methods analytical techniques were used to synthesise quantitative results from the survey (number of respondents in agreement with particular statements) with qualitative results from the interviews (themes and quotations). Information gathered from the survey was used to triangulate and support evidence of interview responses for each research question.

Internal validity and external validity are a significant limitation to the study's methodology. The quantitative research provided initial answers to the research questions, and the qualitative data acquired through interviews provided additional context for the research and a deeper understanding of the responses. The survey was optional, and 36% of students were not represented. The interview was optional, and 85% of the students were not represented.

Results

Quantitative results

This study sought to identify students' perceptions of faculty care and relationships when technology was used. Students completed a modified version of the EDSCLS Survey. The variables used in this study were proxies derived from the items in the EDSCLS Survey, and all items were measured on a 1 to 5-point scale, with 1 denoting *strongly disagree* and 5 denoting *strongly agree*. Each of the variables used in the study is described below, including the items from the survey that constituted it.

Student variables

Perception of faculty caring: This composite variable was created by combining the following 10 items:

The instructor understands my academic concerns
The instructor is available when I need to talk with them
The instructor of this course cares about me.
It is easy to communicate with the instructor of this course
The instructor makes me feel good about myself
My instructor praises me when I work hard in this class
My instructor gives me the individual attention when I need it
My instructor expects me to do my best at all times
I can communicate with my instructor about problems or questions I have in class
The instructor of this course models a strong professional online presence

Technology caring: This was measured by the following item:

Through the usage of technology in this course, I feel cared for by my instructor

Data analysis

To answer the pertinent research questions, the data for students were analysed through Pearson correlation using the statistical software, SPSS version 24.0. Results are presented in Table 1.

The relationship between *Technology caring* and *Perception of faculty caring* was significant, $r = 0.58$, $p < 0.01$.

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Table 1. Relationship between students' perception of instructor modelling caring actions

	1	2	3
1. Perception of instructor caring	0.767**	-	-
2. Technology caring	0.552**	0.582**	-

** Significant at 0.01(two-tailed).

Qualitative results

The carer

Seeking to identify what constitutes care, we examined and coded all student interviews (n = 45). From student responses, 10 modelled caring themes emerged, which helped develop a more nuanced picture of students' perceptions of feeling cared for by faculty (Noddings 2005). Table 2 provides representative responses for what students deemed as a model of caring.

These response patterns indicate students most often equate caring with accessibility and a perceived willingness for faculty to go beyond what students feel are typical class norms of helpfulness. They often deemed faculty's personality or reputation an indicator of care and almost half felt faculty's attempts to get to know them personally made them feel cared for.

It is noteworthy that 96% indicated feeling cared for in the survey although only 20% said faculty made explicitly caring statements. This would seem to indicate that faculty's actions were more important than their words. Most surprising may be that students did not equate faculty's flexibility (with due dates and extensions) and understanding (with absences and the like) with caring. This may dispel the myth that faculty cannot hold students to class policies, expectations, and deadlines and still be deemed caring (Varallo 2008). A notable feature in this study is that students were asked to explain the modelled caring action by the faculty member participating in this study that made them feel cared for, so their responses were not related to faculty in general.

The cared-for

While coding the data, it became evident that we needed to tease out more specific themes related to the role technology plays in feeling cared for. The four themes that emerged helped us separate students' perceptions of care from convenience and/or preference. It is notable that students often confused convenience and personal preference for caring when being asked directly. Table 3 provides representative responses drawn from the larger collection of responses.

These response patterns indicate when faculty improve convenience for students, such as providing ease of access to class materials and electronic submissions of assignments, they were overwhelmingly (84%) thought of as caring. Presumably students felt this was an effort to make life easier for them rather than as a convenience for the faculty member. Student responses that referred to convenience exclusively referenced some type of technology. A significant number of students interviewed (40%) also equated short response time (to email, texts, etc.) with

Table 2. Emergent themes for the research question, 'What actions by faculty constitute "caring"?'

Themes	Example responses	% of students
Availability (to meet)	'He was willing to meet with me whenever.' 'She's made it um very easy for us to meet with her about our papers or anything we need.'	65
Flexibility/ Understanding	'She understood like when I was really sick.' '…being flexible with different deadlines.'	18
Helpful (beyond classroom norms)	'She's just gone out of her way, not a lot, but a little to like help me.' '...compared to other instructors, just because she goes out of her way to help us with anything.'	67
Approachability	'I certainly feel comfortable going to her for help.' 'I'm able to go to him when I need help and stuff.'	33
Personality/ reputation	'…seem to have a caring attitude towards students.' 'She's never like mean about it.' 'She was very upbeat.' '…based on her personality.'	40
Effort to know the student personally	'He wants to know about how we are in our other classes and how we are in life.' '…knowing my name and knowing about my life, why I'm taking that class.'	44
Outside (classroom) interaction	'She took me to a conference with her last years, so I know she cares about me.' '[we] have dinner together.' 'She's been the adviser for BC Voice.' 'Well, I actually had her first semester as well as second semester.'	22
Makes explicitly caring statements	'You're going to be fine.' 'Hey, is everything okay?'	20
Reaches out	'…reaching out knowing, what, what I needed help with before I even had to ask.' 'She's the one who really pushed me into grad school.'	27
Other	'She always tried to engage the class.' '…was never just a lecture thing.' 'He has everything laid out step by step…'	53

caring. It is possible this is connected to student responses in Table 3 that indicate students felt availability equated to caring.

To determine whether or not students felt they had a professional relationship with faculty, they were asked directly 'Do you feel you have a professional relationship with your professor?' Students overwhelmingly (75%) felt they did have a professional relationship. The remaining 25% indicated they had no professional relationship or were not sure of the relationship.

We then sought to isolate the impact of technology on the student–faculty relationship. Regarding the closed question, 'What type of impact did technology have on your relationship with your professor?' Nearly three-quarters of students (73%) responded technology had a positive impact on their relationship. Twenty-two per

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Table 3. Emergent themes for the research question, 'What role does technology play in students feeling "cared for"?'

Themes	Example responses	% of students
Convenience	'It was super convenient having it so that when you have little questions that could be affecting your grade, she's going to be like there responding through technology.' 'I like the fact that you can go anywhere on any website, go to Google and you can find it.'	84
Response time	'Being able to get feedback quickly online.' 'Email, she was really fast with her emails.' 'I really liked the online feedback because it's more immediate.'	40
Accessibility	'I think it's just easier to contact your teacher.' '...Remind app and we could text her and … it was really easy to communicate with her.'	33
Connectedness	'...it's kind of extended outside of class.' '...that, you know, helped us engage as what, like people were doing.' 'I really enjoyed the ability to compare how others performed.' 'You're not only connected with the professor in the classroom but also outside of the classroom.'	24

cent of students felt technology had no impact, a neutral impact, or were not sure if there was an impact. A key finding is that not one student felt technology had a negative impact on their relationship.

Although students felt technology had a positive impact on the student–faculty relationship overall, the method for providing feedback seemed to have no significant impact on their perception of care. Students' preference for feedback format was mixed with just over half (57%) of the participants indicating they prefer electronic, while 23% of the participants prefer written or face-to-face, 8% of the participants prefer a combination and 12% of the participants had no preference.

Discussion

The overarching goal of this study was to identify the impact technology has on student–faculty relationships. The study investigated student perceptions related to faculty caring and the implementation of technology strategies designed to promote relationships, communication and accessibility. It sought to answer the following research questions from the students' perspective: (1) What actions by faculty constitute "caring"? (2) What role does technology play in students feeling "cared for" (Noddings 2005)?

The researchers' initial assumptions were that female faculty would be seen as more caring (Harford 2018) and that humanities faculty would be seen as more caring than faculty in the hard science. However, there was no data to back these initial assumptions.

The key findings indicate that technology has a positive impact on how students perceive feeling cared for by faculty by increasing accessibility and direct contact.

Secondly, students identified several indicators of care, including faculty accessibility, flexibility, helpfulness, approachability, personality, effort to know the student personally, outside classroom interaction, making explicitly caring statements and reaching out. Thirdly, the mode of feedback (i.e., electronic, written or face-to face) had limited impact on students' perception of feeling cared for. When asked about their feedback preference, students reported: 57% technology/electronic, 23% face-to-face and/or written and 20% a combination or no preference.

The longer or more times a student interacted with a faculty member, regardless of the circumstances, the more likely they were to say they felt the faculty cared for them. Students noted various types of interactions, including previously having the faculty member for another course, a club advisor or the supervisor of a conference trip or study abroad experience. This would seem to indicate that a more personal connection supported by more direct and regular communication can strengthen students' perceptions of being cared for. When commenting on faculty who used a safe texting service in addition to email, students made comments such as 'It definitely connects the students and the students with professor a lot better' and 'It connects people outside of the classroom'.

Although millennials are thought to be digital 'natives' and more proficient than faculty, this simply is not true (Kirschner and DrBruyckere 2017). In fact, several students mentioned not being tech savvy. They made statements such as 'I am not very good with technology' and 'It was kind of out of my comfort zone'.

Others made the presumption that younger faculty were more tech savvy regardless of the level of faculty experience or the use of technology in the classroom. For example, one student stated that a younger faculty member was, 'very good about understanding that this is a more… technological era… it's not just, you know, like some older professors might…pick up a piece of chalk on the white board'.

Students often felt it was primarily for their benefit when a faculty member employed technology in the classroom rather than for the faculty's own benefit. For example, one student noted, 'I think that her having [the texting app] and using it is really beneficial to the students'.

Although the method for providing feedback seemed to have no significant impact on the student–faculty relationship or feeling cared for, those who preferred electronic feedback overwhelmingly noted the convenience, including factors such as the ability to easily access the information at a later date (rather than searching through old papers) and noting it was often easier to read or understand compared to deciphering faculty handwriting. Comments such as 'When she gives feedback... through Google Classroom, it's nice for us... because we can't lose it' and 'I like the online feedback better because with traditional you have to wait until you're in the classroom' were common. This echoes the research that indicates students appreciate electronic feedback because of its immediacy, economic, and environmental benefits (Bayerlein 2014; Sopina and McNeil 2015; Ryan, Henderson, and Phillips 2019; Walter, Ortbach, and Niehaves 2015).

Conclusion and future research

This study seeks to add to the research by further identifying what students perceive constitutes care in the classroom and the impact of technology on the student–faculty relationship. The results demonstrate that implementing technology can help build caring relationships. Furthermore, they indicate that faculty who take the extra time

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to exhibit care for students have a positive impact. When students feel genuine and sustainable care from faculty, they reciprocate by working harder academically, being more engaged and spending more time on-task, improving academic performance and overall development, and having more confidence to learn (Addison 2012; Ceylan *et al*. 2012; Nadge 2005; Noddings 2005; Velasquez, Graham, and Osguthorpe 2013). As faculty take time to develop relationships, they can better recognise students' needs and create stronger learning experiences. Freire (1998) noted, 'sometimes a simple, almost insignificant gesture on the part of [faculty] can have a profound formative effect on the life of a student' (p. 46). While this study's results indicate that the integration of technology had a positive impact on relationships, all classroom dynamics differ; thus, implementation of any of these technology strategies does not guarantee stronger relationships or rapport.

This study is part of the initial research of student perceptions on how faculty from any discipline in higher education can use technology as a tool to develop relationships. Future studies on how technology can be utilised to develop and maintain relationships are recommended. This research was completed at a small private liberal arts institution where the learning community is a priority. Duplicating this study with other students or faculty at the same or a different institution could change the results as perceptions may vary significantly. Specific technology resources, apps or websites could be intentionally studied to determine an impact on relationships and communication. Researchers can work to create or identify an assessment instrument with stronger content validity to measure students' perceptions of relationships. Additional studies may want to adjust the research methodology to implement a control and experimental group, which would better isolate technology as the tested variable.

Declarations

Disclosure statement

No potential conflict of interest was reported by the authors.

Availability of data and materials

The authors confirm that the data supporting the findings of this study are available within the article or its supplementary materials.

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