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Integrating Values-based Outcomes in Capstone Experiences

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Abstract: Undergraduate programs that focus on disciplinary knowledge and skills can reinforce pre-existing mindsets or ideologies that can lead to insufficient questioning of certain types of information (e.g., empirical data or model results) or insufficient valuing of certain types of information (e.g., Indigenous knowledge). One way to address this challenge is to include values-based learning and assessment strategies that empower students to better understand and engage with their complex and changing worlds. General Education (GenEd) Capstone Experiences (CE) often seek to instill values such as thoughtfulness, openness, and responsibility, but scholarly analysis of the pedagogies and their effectiveness is limited, as is discussion on the inclusion of similar pedagogies in discipline-focused courses. This study addresses this research disparity by using a mixed methods approach to investigate student and faculty perceptions of the values integrated by a GenEd CE program and the pedagogies used to integrate those values. Results demonstrate that the integration of reflection and discussion pedagogies has the potential to influence a variety of values-based outcomes. Institutional leaders and CE instructors may integrate these pedagogies into their CEs, with mindful attention to the associated values that they seek to instill.

Keywords: undergraduate, capstone course, values, pedagogy, student learning outcomes, general education

The challenge of balancing between knowledge, skills, and values in education in university curricula is an ongoing conversation (e.g., Sidaway & Johnston, 2007), with many undergraduate programs around the world becoming increasingly utilitarian and functionalist because of pressures to align courses with an employability agenda (Goldberg, et al., 2014). An unintended consequence of this focus on disciplinary knowledge and skills is reinforcing pre-existing mindsets or ideologies, whereas a curriculum that includes values-based learning and assessment has the potential to enable students in any discipline to understand the complex and changing world they inhabit from multiple and alternative perspectives, allowing them to flourish in their personal, civic, and work lives (Griffin & Burns-Ardolino, 2013).

One means of implementing such values-based learning is CEs themselves. Students, faculty, and administrations highly value CEs as "transformative" (Kinzie, 2013) and a "high impact practice" (Kuh & Schneider, 2008). Emphasizing the transition to life after college, CEs can address learning domains such as post-graduation life and employment (Gardner & Van der Veer, 1998; Henscheid et al., 2000), academic skills (Lee & Loton, 2019; Young et al., 2017), and coherent connections among general education (GenEd) courses and major (disciplinary) courses (Kinzie, 2013; Young, 2016).

Faculty members generally teach courses and/or direct projects that define the CEs (Young et al., 2017), which are often aligned with the values of their institutional missions (Redman, 2013). While a large majority of CEs are discipline based (Coker & Gatti, 2017), about one-third of U.S. colleges and universities have GenEd CEs (Keup, 2013).

CEs take many forms. Some require integrative research projects, performances, or exhibitions in a student's major (Kuh & Schneider, 2008). Others are informed by accreditation and licensing agencies to fulfill professional development conditions (Agboola et al., 2012; Draves, 2013). The present study draws on a third form of CEs—courses that draw on assignments and discussions to support individual needs of students in transition from college life to post-college life (Weiss, Kirkscey, Vale, 2021;Brooks, Benton-Kupper & Slayton, 2004; Coker & Gatti, 2017). This more expansive form of CE is usually considered part of an institution's GenEd curriculum and may have interdisciplinary components.

We focus the present study on GenEd CEs because they provide an effective medium to examine the efficacy of including values elicitation as a student outcome. We also investigate the associated pedagogies, which can be extended into disciplinary CEs to achieve these same, values-based outcomes in courses where they are often excluded. We argue that GenEd CEs can provide insight into how higher education can (1) allow students to assess and develop their values, and (2) instantiate higher level cognitive skills such as analysis, synthesis, and evaluation beyond the scope of their major.

This study is informed by the theory of transformative learning, which serves as a broad framework for contextualizing and integrating previous experiences to facilitate impending life decisions. Moreover:

> We transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, mind-sets, mental models) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective, so that they may generate beliefs and opinions that will prove more true or justified to guide action. (Mezirow, 2000, p. 7-8)

Instead of focusing on the instrumental view of adult learning, which is based on "the needs and demands of the broader, socio-cultural context," transformative learning emphasizes "perspective transformation" (Dirx, 1998, p. 3-4; refer also to Mezirow, 1991). Undergraduate GenEd CEs, which concentrate on the transition between university education and post-graduate life, often encourage students to reinterpret their university experiences to (re)consider and build future life expectations based on values analyses elicited through assignments and discussion (Martin & Strawser, 2017).

To measure how instructors may generate and apply values elicitation, we performed a mixed-method, third party assessment of the Boston College Capstone Program (BCCP). We use data from student and faculty perceptions of the program's learning outcomes as an illustration for administrators and instructors considering the inclusion of values-based outcomes in their institutions' CEs (disciplinary or otherwise). Our efforts contribute to continued academic discussions that define, describe, and evaluate GenEd and interdisciplinary CEs and, more broadly, capstone outcomes by responding to the following research questions:

- Can faculty and students integrate values into a capstone experience?
- What pedagogical methods achieve this integration?

We begin by reviewing pertinent scholarly literature and describing the BCCP. We then explain our mixed-methods approach, which combines quantitative survey results from students and faculty with

a qualitative thematic analysis of two faculty focus groups. Our results and discussion follow, and we conclude with a discussion of the implications of the study.

Literature Review

Few GenEd capstone programs have been documented in scholarly literature, especially when compared to the wealth of discipline focused equivalents (Kinzie, 2013). Of the research that does address GenEd CEs, most scholarship is based on case studies with little data providing assessment of learning outcomes and program efficacy (Coker & Gatti, 2017). Young et al. (2017) noted that "Despite the prevalence and the variety of formats of the senior capstone experience as well as enjoying nearly a decade of recognition as a high impact practice, only a modest amount of research has been done to evaluate its characteristics or effects" (p. 11). This statement is especially true in relation to studies that rely on data produced by CE students meant to evaluate the efficacy of the CE in achieving its goals and outcomes (Young et al., 2017).

GenEd Capstone Experience Curricula

Curricula for GenEd CEs have sought vertical and horizontal alignment among the goals and values of the institution and the courses that students take during their first three years. Millikin University called this integration of previous knowledge "intentional connections...between the major and nonmajor" courses that support the "common threads" of "student learning goals," "core questions, values, and means," and "proficiencies" (Brooks et al., 2004, p. 276). Elon University's model foregrounded the core principles of "ethical reasoning and personal and social responsibility within local and global communities" (Coker & Gatti, 2017, p. 1). Grand Valley State University based its program on the American Association of Colleges and University's LEAP model, which includes "problem solving, collaboration, ethical reasoning, …quantitative literacy …integrative learning, oral and written communication, information literacy, and critical and creative thinking" (Griffin & Burns-Ardolino, 2013, p. 2).

Moreover, several institutions included civic engagement (e.g., Brooks et al., 2004; Coker & Gatti, 2017; Kerrigan, & Carpenter, 2013) and professional development (e.g., Katona et al., 2016; Rowles et al., 2004) as key elements of their CEs. Written and oral communication were also common learning goals (Brooks et al., 2004; Griffin & Burns-Ardolino, 2013). Interdisciplinary or multidisciplinary team projects and service-learning were also required in several CEs (Brooks et al., 2004; Kerrigan & Carpenter, 2013; Rowles et al., 2004). For example, Cal Poly San Luis Obispo began a collaboration between engineering and business majors to work on teams with outside clients to develop final projects (Katona et al., 2016). Elon University used a similar model in its "Entrepreneurship and the Arts" course (Coker & Gatti, 2017, p. 6).

Values in Capstone Experiences

Values addressed in CE courses are often derived from institutional mission statements (Griffin & Burns-Ardolino, 2013; Hammer et al., 2018; Jacobs & Harst, 2005). Several studies noted that the GenEd CEs at institutions emphasized values aligned with university missions (e.g., McGill, 2012; O'Neill et al., 2018). For example, at the University of La Verne, instructors "were encouraged to use…rubrics to continuously evaluate the learning outcomes and their relationship to the values of the institution" in their CE courses (Redman, 2013). CE programs may also rely on constructivist theory (Taylor, et al., 1997) to "clarify personal values and to recognize and reconcile moral dilemmas" (Brooks, et al., 2004, p. 281; refer also to Coker & Gatti, 2017). At Thomas Jefferson University, for

example, a summative CE e-portfolio assignment prompted students to write a reflection essay that included commentary on the development of their values during their undergraduate years (Schrand et al., 2018). Other studies broadly addressed values elicitation and understanding as learning objectives in CEs without listing the values or measuring the relationship between the CE/GenEd curriculum and the institution's and/or program's mission (e.g., Fernandez, 2006; Jacobs & Harst, 2005; Schrand et al., 2018; White, 1994).

Few studies provided detailed lists of specific values that institutions and programs addressed in CEs. Portland State University's learning objectives required that students "gain familiarity with the values, foundations, and responsibilities of democratic society" (White, 1994, p. 227). Millikin University's course addressed "intellectual curiosity and risk taking"; "service, social justice, and civic responsibility"; "self-respect," "aesthetic sensitivity," "respect for differences and human dignity," "commitment to professional excellence," "personal integrity," and "environmental responsibility (Brooks et al., 2004, p. 286). The University of La Verne's CE listed "ethical reasoning," "diversity and inclusivity," "lifelong learning," and "community and civic engagement" (Redman, 2013, p. 13).

Some traditionally technical disciplines have begun to engage more deeply with values; for example, engineering capstone and design instructors are increasingly turning to approaches such as Value Sensitive Design (Friedman and Hendry, 2019) to bridge the socio-technical divide, but research into the efficacy of these approaches is in its infancy (e.g., see Walther et al., 2019 and Hess & Fila, 2016).

The Boston College Capstone Program

The Boston College Capstone Program (BCCP) was established in 1990 and is housed in the Morrissey College of Arts and Sciences (Boston College, n.d.). The BCCP recognizes that, by their final year, students have already become highly specialized; hence, a BC CE moves deliberately away from students' disciplinary specializations to help them integrate the many components of their academic and personal growth. The program hosts approximately 25 seminars each academic year by faculty members from over 20 departments in all four undergraduate colleges within BC. Classes are limited to 15-20 students, about 450 per year. CEs appear together in course registration materials as university courses that are available to all undergraduates during their last two semesters. For a full description of the Boston College Capstone Program, refer to Weiss, Kirkscey, and Vale (2021).

While instructors in each seminar use different materials, topics, and methods, they all adopt a "review and preview" structure whose goal is to empower students to reflect on their past choices and then preview their life goals with respect to the wider community. The BCCP identifies relationships, career, citizenship, and spirituality as the four pillars to be explored (Boston College, 2023). BCCP CEs are heavily based on writing, with multiple essays submitted throughout the term. Capstone instructors employ a discussion method in their seminars and mindfully adopt a "slow pedagogy" (Hartman and Darab, 2012) approach to reflection, discussion, and forward planning.

Methods

This study employed a mixed methods approach. Surveys of BCCP students and faculty were used to obtain quantitative data. After participating in the survey, BCCP faculty were invited to participate in focus groups in which qualitative data were collected. Surveys allowed for structured and high-volume data gathering regarding the perceived impact of the program, while the faculty focus groups allowed for deeper investigation into the applied pedagogies and perceived impacts of those pedagogies. All participants provided written informed consent. This study was reviewed and approved by the Research Ethics Board at the first author's home institution (REB# 19-02-025) and was subsequently waived by the Ethics board at Boston College.

Student and Faculty Surveys

Two surveys were distributed, one for students enrolled in a BC CE during the fall and spring terms, and another for faculty who were current or previous BC CE instructors. Faculty participants completed the survey at various times during the terms, while student participants were invited to complete the survey once, near the end of the CE. Student surveys were voluntary. All surveys collected demographic information including gender, discipline, and department.

The surveys were non-validated and were developed during the multi-year Elon Center for Engaged Learning's Capstone Experiences Research Seminar (Capstone Experiences, 2021) in conjunction with 25 researchers from four countries, comprising a broad cross-section of disciplinary backgrounds. All individuals had previous experience with CEs, pedagogical research, and survey design.

The authors leveraged these individuals' research and pedagogical expertise to develop lists of potential CE values. A literature review based on the authors' previous research (Kirkscey, et al., 2021) was also conducted to populate these initial lists. The final lists were simplified through a process of identifying synonyms and/or identifying items of particular interest to some disciplines (e.g., an engineering researcher requested including *professionalism*, while a theology researcher requested including *spirituality*), and then binned into three categories using thematic analysis. The final categories and associated outcomes were presented to seminar attendees and leaders for final endorsement.

In both faculty and student surveys, participants were asked to consider three categories:

- **Values:** your principles or standards of behavior; your judgment of what is important in life.
- **Skills/Competencies:** the broad range of abilities necessary to perform well in university, subsequent employment or society, with results of acceptable quality.
- **Attitudes:** your way of thinking or feeling about someone or something, typically one that is reflected in [your] behavior.

The complete list of outcomes from each category are shown in Appendix A.

In the survey, all participants were asked to rank the three categories (Values, Skills/Competencies, Attitudes) from most important to least important in the context of their CE. All participants were also asked "What [Values/Attitudes/Skills & Competencies] do you think are affected by the capstone? (Select at most 5 from the list, including the option to select "none" or "other" and fill a text box)." Beyond demographics, no other questions were asked on the survey.

Survey Participants

The surveys of faculty and students assessed perceptions of the outcomes of the CE. All current and some past instructors (n=25) participated during the 2019/2020 academic year. Three separate cohorts of students participated (2018- 2020, n=115, total population = 737). Students may enroll in a maximum of one CE, so the same student was not present in multiple cohorts. Students were invited to participate using an anonymous link distributed via an email list-serve. Faculty were invited to participate via personal email links.

Faculty Focus Groups

Two simultaneous focus groups (n=11 and n=16) were conducted with faculty during the 2020 annual BCCP instructors' retreat. Focus groups were 1.5 hours long. Focus group prompts are in Appendix

B. Faculty included both current and previous CE instructors. Most focus group participants (n=25) had completed the survey prior to attending the focus group. Each focus group was led by one of the authors, neither of which is affiliated with Boston College. The program director was not present during the focus groups. Due to Covid-19 restrictions, the focus group meetings were held remotely using the Zoom platform.

Quantitative and Qualitative Analysis

Quantitative survey data were counted and compared using Chi-squared tests for association, with $p<0.05$ indicating significance. This test was conducted to examine relative rankings of the importance of values overall as compared to other outcome types, contributing to the research question of whether values can be elicited and which values were elicited, which is used in conjunction with the focus group results to investigate the impacts of various pedagogies on specific values. All statistical analyses were performed in R (version 3.5.1). In all cases, the percent contribution to the chi-squared statistic was reviewed to evaluate the relative importance of the finding.

Qualitative data were coded using two distinct methodological approaches with coding discussion and rater training as an iterative process. Inter-rater reliability was measured using ReCal 0.1 Alpha (Freelon, 2010). Fleiss' Kappa score (Fleiss, 1971) was .74, which indicated substantial coder agreement (Landis & Koch, 1977).

The first qualitative coding approach contributed to the question of whether the instructors' pedagogies addressed value integration in course topics and assignments. Authors Two and Four adopted an interpretive approach to examine the focus group transcripts, which afforded an opportunity to understand emergent meanings as participants interacted socially with subject matter (Denzin & Lincoln, 2011). Authors Two and Three manually coded phrases using inductive thematic analysis (Braun & Clarke, 2013). They identified and agreed on emergent themes. After additional reading, the two authors identified, discussed, and synthesized core themes into final themes. The analysis process was supported by memoing (Miles & Huberman, 1994).

The second qualitative coding approach contributed to investigating both research questions. Here, we adopted a codebook using the values-based outcomes as listed in the survey (see Appendix C for full definitions). These terms and cognates were used to run searches using NVivo version 11. Authors Two and Three discussed the meaning of each of the search terms prior to reviewing the NVivo search results, leveraging the themes that emerged from the first coding approach, strengthening analytical reliability across the methods. Author Three reviewed the resulting NVivo searches and accepted or rejected each passage. Author Two reviewed Author Three's coding and agreed or disagreed with the coding. Author One broke any resulting ties.

Results

First Research Question: Can participants integrate values in their CE?

Our first research question asked if faculty and students can integrate values into their CE. To address this question, we present emergent (open coded) themes from the faculty focus groups to show that values-related themes were more prevalent than other themes. We then present the survey data regarding the perceived relative importance of values as compared to attitudes and skills/competencies.

Faculty Focus Groups

Many faculty comments placed a strong emphasis on the exploration and development of values. When faculty were asked to articulate the purpose of the BCCP, the most frequent response was *prompting students to attend consciously to their personal development*. Faculty expressed the importance of students coming to understand their whole selves, and to think beyond themselves: "seeing their connectedness and being a part of a whole that's something greater than themselves … going more broadly into the whole community." This goal was achieved through *reflection* (the most coded emergent theme): "Reflection is the single most important piece of capstone." Indeed, *reflection* is viewed as a tool to allow the BCCP to act as a fulcrum in the student's undergraduate learning journey: "A chance for students to think more deeply about the choices they made … and then anticipate the sorts of choices they'll have to make in the future." Faculty also viewed the BCCP as *consciously holistic*, developing students beyond disciplinary expertise towards full understanding of who they are and what they might offer to a myriad of others: "So, we go from 'How I'm gonna live my life' and 'How have I lived my life' to 'How can the world be better?' and 'What's my role in that?" Other values discussed at some length by faculty were related to citizenship, spirituality, and friendships/relationships, with all of these areas related to caring for others.
Note that a minority of faculty did indicate a need to develop s*kills and competencies* and those discussed most by faculty were critical thinking, reading, writing and discussion:

> I think they need skills. I think they need them bad. I mean, I get students, second semester senior students who do not know how to think critically. and I say, 'What have you guys been doing for four years anyway?'

Student and Faculty Surveys

Survey participants (faculty, n=25; students, n=115) were asked to "rank the three categories (values, skills and competencies, and attitudes) from most important to least important in the context of your capstone." We summed the results and collected them into a contingency table, then performed a chi-squared analysis. These statistically significant results (p=0.000) clearly show that participants feel that values are very important, and that *skills/competencies* are least important. While *attitudes* appear have a strong showing in second place, the statistical analysis indicates that both *attitudes* and the middle ranking are the weakest contributors to the chi-squared statistic (see Table 1).

Table 1: Category Rankings Describing the Relative Importance of Values, Attitudes, and Skills/Competencies in the CE.

Ranking	*Values*	*Attitudes*	*Skills/ Competencies*	*Contribution to chi-squared statistic of each rank*
Most important	96 *	30	14	39.2%
Middle	31	81	28	18.4%
Least important	13	29	98*	42.4%
Contribution to chi-squared statistic of each category	39.6%	18.4%	42.1%	

Note. Students n=115. Faculty n=25. Significance, p=0.000.

* Indicates contribution of 25% or higher to chi-squared statistic. Note that some percentages do not sum to 100% due to rounding errors.

Given the small sample size in the faculty group as compared to the student group, a natural question is whether the results in Table 1 hold for both groups, or whether the student responses overwhelm the faculty responses. The faculty sample size was too small for a statistical analysis, so we present the results in chart form, with 95% confidence intervals included for comparison purposes (refer to Figure 1). Figure 1 indicates that alignment exists between faculty and student perceptions of the relative importance of values, attitudes, and skills/competencies.

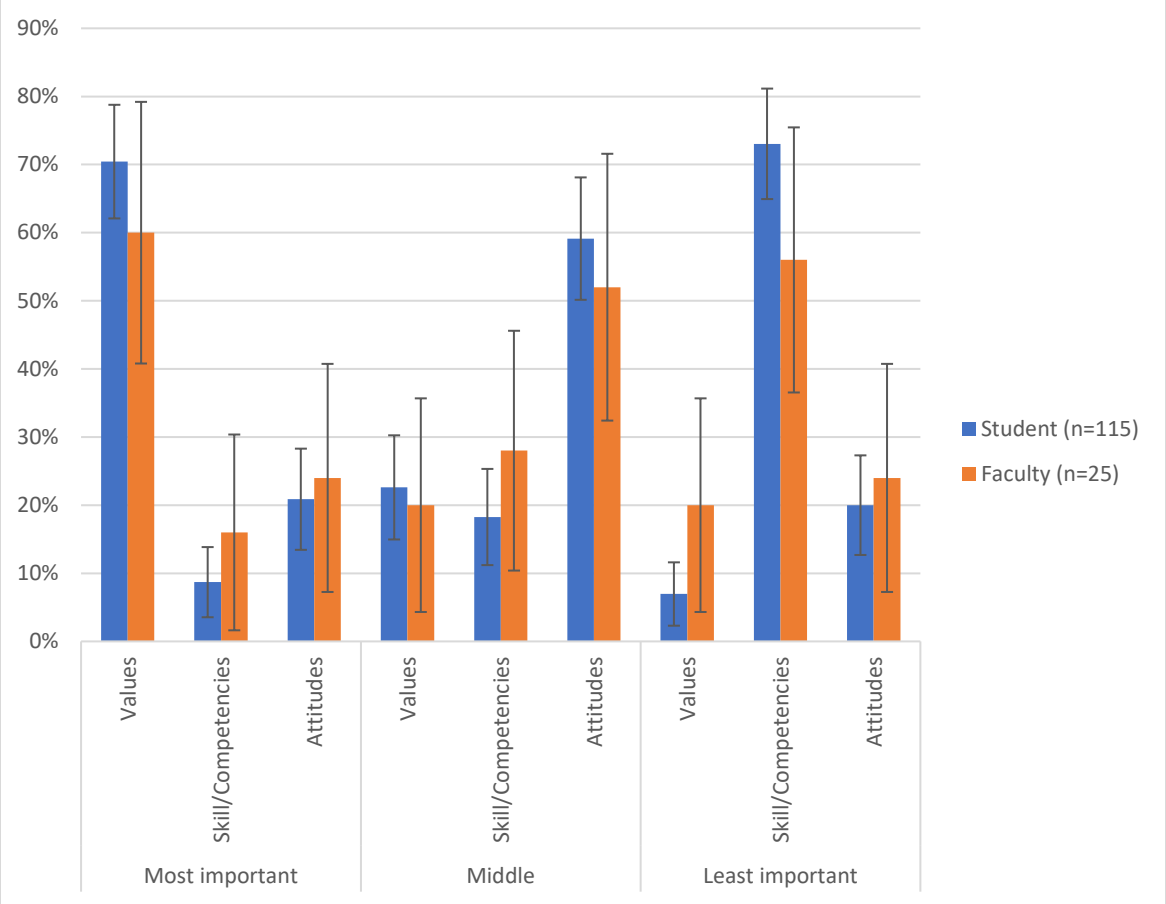

Figure 1: Perceived relative importance of categories: Comparison of student and faculty responses. Bars show 95% confidence intervals. Data is shown in relative proportions (count/n) for ease of interpretation.

Second Research Question: Do the pedagogical approaches achieve this integration?

Here, we investigate the second question: whether the pedagogical approaches taken in the BCCP achieve the integration of values-based outcomes. To do so, we first present emergent themes from the faculty focus groups regarding the most prevalent pedagogical approaches. Then, we present the results of the survey response to the question "What values do you think are affected by the capstone?" to identify which, if any, values-based outcomes are impacted by the CE. Finally, we offer the coded focus group data to present faculty perceptions of which value-based outcomes are affected and why.

Faculty Focus Groups: Pedagogical Approaches

Faculty were strongly committed to engaging students in *self-reflection* in their classes. As such, faculty spoke about adopting pedagogies that afforded curricular time and space to encourage students to understand how they have become who they are and how they could interact positively with a diversity of other learners. This included contemplative and dialogic pedagogies:

> We spend time on contemplative, reflective practices … going back and remembering and re-interpreting experience in light of new experience … I describe it as a reflective tool kit.

> What I mostly do is engage students in discussion-based and activity-based exercises. The course flow moves from individual reflections that they've been doing about their own life and where they're going … towards more systemic issues.

Faculty reported minimizing transmissive lectures, instead offering students time to consolidate and integrate their understanding:

> […] that moment of pause where the agenda is to integrate stuff and make it more coherent … as opposed to simply learning more of a particular discipline.

Moreover:

> We do mindfulness practices each class … we go through a sequence of things, thinking about themselves, thinking about how they relate to others … and thinking about the bigger system and where the problems are.

Finally, there was clear intent to cede authority to students to allow them to direct their own learning. As such, CEs were described as flexible, 'letting the course go where it needs to go', enabling bespoke content and delivery according to cohort interests.

Faculty and Student Surveys: Values Impacted

This section focuses on the faculty survey question "What values do you think are affected by the capstone" and the equivalent student survey question "What values were affected by the capstone?". Participants could select *No values were impacted* or *Other*. No participants selected *no values were impacted*. Some participants selected *Other* at least once (frequency=18 students, frequency=25 faculty) and used the text entry box to add terms such as *synthesis, hard work, authenticity, mindfulness,* and a variety of others. We did not include results from *Other* in our further analysis since the selection was used to express a wide range of outcomes, none yielding counts higher than two.

Student results of values were categorized into three main groups (see Figure 2). Student participants selected *thoughtfulness* and *openness* at roughly equivalent, high rates, with just over 60% of participants selecting each outcome. The second grouping was *responsibility*, *career orientation*, *compassion*, *empathy*, and *professionalism*. Finally, the lowest selections were *integrity*, *intercultural sensitivity*, *citizenship*, and *ethical sensitivity*, with approximately 25% of participants selecting each of these outcomes.

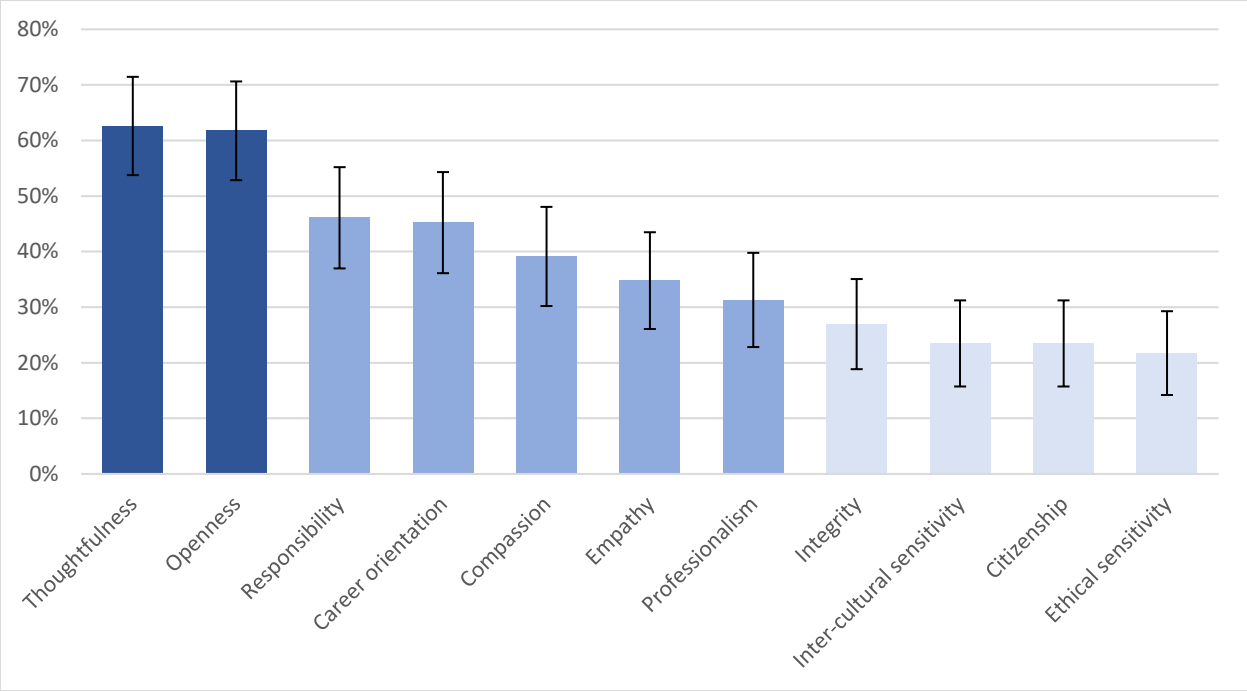

Figure 2: Student responses to "What values were affected by the capstone?" Normalized to the number of student participants (n=115), with 95% confidence intervals shown.

While the faculty sample size was small, we leveraged the student data to elicit interesting results from the faculty responses. To do so, student and faculty responses to the survey question were summed and organized into a Chi-squared contingency table to determine if the distribution of categorical data differed between faculty and students among the 11 values (see Figure 3). Results show significance (p=0.007), with the three largest contributors to the Chi squared statistic all related to faculty: *professionalism* (23%, low compared to student counts), *integrity* (19%, high compared to student counts), and *inter-cultural sensitivity* (17%, high compared to student counts).

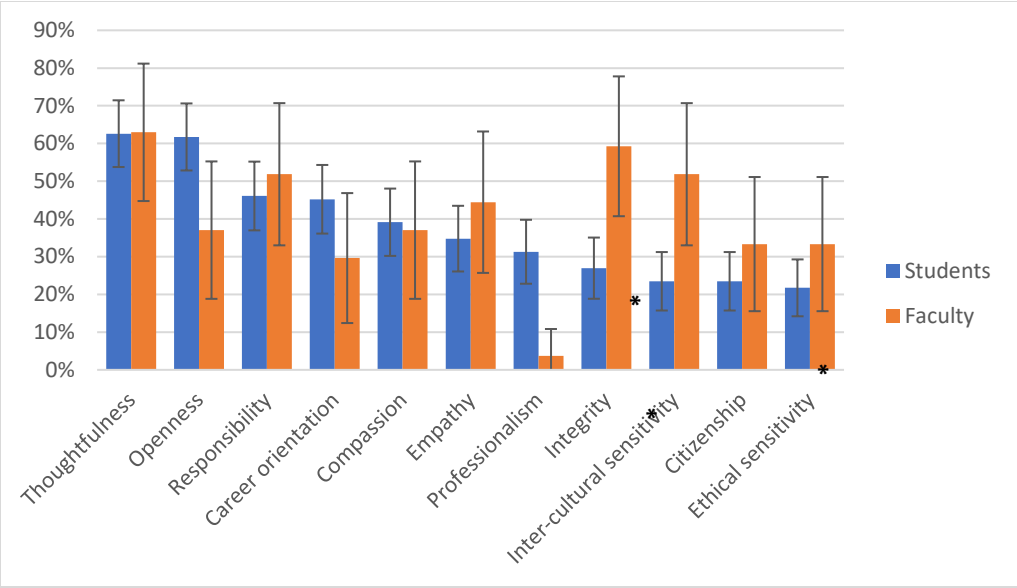

Figure 3: Values impacted by the CE: Comparison of student and faculty survey responses.

All values shown are relative proportions (count/n) for ease of interpretation. Bars are 95% confidence intervals. Student responses (n=115); faculty responses (n=25). Statistically significant (p=0.007). * Indicate high contribution (>17%) to chi-squared statistic.

Faculty Focus Groups: How Were These Values Elicited?

We now turn back to the focus group data to investigate how faculty believe they are eliciting or integrating these values and what (anecdotal) evidence they have that students are integrating these values. We differentiate between these two categories via:

- **Faculty integration:** participants discussed integration of the value via lesson planning, assessment, or curricular design
- **Student integration:** participants related anecdotes about students enacting the value

Furthermore, during the process of coding, we found that *thoughtfulness* was the most prevalent value (n=58 faculty integration, n=21 student integration), so we further separated this theme into two subthemes:

- **Thoughtfulness (Others):** consideration for the needs of others
- **Thoughtfulness (Reflection)**: considering deeply about a thing

Code rates are presented in Table 2. By far, the most prevalent themes were *thoughtfulness*, *openness*, and *citizenship*. Conversely, there were few references to *empathy*, *integrity*, and *ethical sensitivity*, with no instances of *professionalism*.

Table 2: Focus Group Coding Results.

Value	# Codes Faculty Integration	# Codes Student Integration
Thoughtfulness	58	21
Thoughtfulness (Others)	39	6
Thoughtfulness (Reflection)	19	15
Openness	23	8
Responsibility	8	0
Career orientation	8	9
Compassion	5	4
Empathy	4	0
Professionalism *	0	0
Integrity *	3	1
Inter-cultural sensitivity *	5	0
Citizenship	18	3
Ethical sensitivity	2	0

Note: The order of the outcomes is the same as that in Figure 2 above for comparison purposes.
* Indicates outcomes that had a strong contribution to the Chi-squared statistic in Figure 3.

Faculty selected *integrity* at statistically impactful high rates on the survey as compared to students, but there were almost no codes related to *integrity* from the focus groups. We also saw fewer overall codes (roughly 1/3) regarding student integration as compared to faculty integration.

In the following sections, we present data from the top three overall focus group codes: *thoughtfulness, responsibility,* and *citizenship*. We also present data from *Inter-cultural sensitivity*, given the combination of its contribution to the chi-squared statistic and its strong prevalence in the focus group comments.

Thoughtfulness: Reflection and Openness

The faculty focus on *thoughtfulness* was heavy, with roughly one-third of the codes attached to this value. Faculty discussed thoughtfulness in the context of self, multiculturalism, power and privilege, civic duty, career, and others. Participants sought to elicit *thoughtfulness (others)* in many ways. For example:

> One of the things I do the very first day of class when I go through my syllabus is to […] ask them who's taking it for what reason. And I say, I want you to look at each other because you're all here for different reasons and we need to respect the needs of all of you.
> […] I have them try to identify what the positionality is and how they relate to others in terms of power. And that means to go back and define those things that have contributed to how they feel about themselves in relationship to others. But that's where they start to connect with family again and friends, and race, ethnicity, gender.
> […] And by understanding who they are in relationship to others and the kinds of power they have.

Participants also stressed the importance of *thoughtfulness (reflection)* in their course delivery. For example:

> What I focus on most is the development of reflective judgement--their ability to systematically and critically think about ill-defined dilemmas, moral, cognitive dilemmas, across multiple contexts from multiple perspectives….

> [Asking them to think about]… what would life be that really was most deeply yourself and met your highest ideals? And how does that compare to your feelings of pressure to do something instrumental or to respond to actual or perceived signals from your parents or a society about what counts and what you ought to do? So that kind of dissonance… 'Wait, I thought I was going to go into business, but I really love X. Maybe I should do non-profits, but what will my parents think?'

Consistent with the BCCP's focus on *reflection*, the highest code count for student integration is in the *thoughtfulness (reflection)* theme. Anecdotes ranged from the general:

> … from conversations with the students and emails and texts, they volunteered that 'This is a special time for me. I've actually had a chance to stop and think.' And in the past few days, I've gotten several emails from current students saying, 'the class

> enabled me to take advantage of this incredible opportunity of having all this time to really think about who I am and what I want to do with my life.'
>
> One of my students who took capstone from me, I think 5-6 years ago, contacted me […] She had been unable to actually leave her home from the time after she had graduated from BC. And she told me it gave her a lot of time to think about the courses she had taken at BC and the choices she had made […] she said that some of the things she learned actually in the capstone we, we did in my class was really very helpful to her to figure out how to get through some of this at the time.

Openness

The next most prevalent theme was *openness*. In this theme, participants recognized the need for students to be open to new experiences in order to be able to take risks that are required to elicit some of the other values:

> […] perfectionism is such a huge shutting down of natural openness, taking risk. Not only opening up to what the world needs or opening up to risking stepping out of your comfort zone. I don't even think (students) are in the comfort zone. I think their permanent perfection is a discomfort zone and they have a real difficulty moving out of it. So I really like them to learn to value reflecting on what they're hanging on to that's not helping them or other people, and then risking that openness. I don't think that they do that very often. So that would be, if they could walk away from my class feeling more open themselves than letting go of the things that don't serve them, it would make them more able to serve others.

Discussion of how *openness* was elicited through class activities was sparse, but one participant indicated they:

> […] focus on listening as a skill that we can practice, and mindful listening and then have them do an interview project with someone a generation or more older than themselves. Just to get into that habit of being curious about others.

Another participant leveraged reflective exercises to elicit *openness*:

> […] what does that really mean in terms of how I live my life and how does that value relate to me? I think when you go through that process in a rigorous way, I think you can't help but understand some of the inconsistencies that you yourself have in some of the ways in which you don't live up to the values that you may espouse […] And when I think about that and that really self-awareness and self-understanding, I think that hopefully that leads people to be more generous in their thinking and their appreciation of the ways in which other people try to live their life as well as they can.

Anecdotes regarding student integration of *openness* were varied, with some anecdotes going so far as a student volunteering their history of sexual assault. Other participants shared stories of mindset shifts:

> I had a student years ago, a guy, a kind of big strapping guy […] who wasn't sure he was going to take the class and was thinking about dropping it because he said it sounds like therapy. He decided to stay with it, and he turned out to be a very productive member of the class. And at the end he said, you know what? "If this is like therapy, then I'm all for it." So, it certainly changed his mind in that area.

Citizenship

One of the pillars of the BCCP is civic duty. This value is consistent with the prevalence of *citizenship* references in the focus group discussion. For example, one participant discussed both the importance of *citizenship* and how they elicit it in the course:

> I think citizenship—we talk a lot about civics in my class—is in some ways more important historically because we're saturated in this notion of the individual and the importance of the individual. What we don't get enough of, I would argue, is the participation part and how we're all interconnected. So, my students have to go out and they have to go attend some political meeting and then come back and report on it and how democracy actually works down at the local level and so forth and how they aren't involved in that network.

Given the prevalence of comments regarding the importance of *citizenship*, few comments addressed how students integrated it, with most of these comments focusing on an assignment rather than the outcome of that assignment (e.g., "And then they write a future vision statement looking back on their life as they hoped they would have lived it").

Inter-cultural sensitivity

While *inter-cultural sensitivity* initially yielded a high number of codes, many of the results were related more to the idea of culture itself (often the culture of Boston College), or to sensitivity, but did not include the *inter-* aspect of this value and were therefore rejected as support for the theme. However, some faculty responses did directly address pedagogical approaches to teaching this value:

> […] each novel [assigned for reading] is about a different culture, and we spend some time discussing culture, I hope that they get a greater understanding of that culture, and it gives them a wider appreciation for the difference and a greater understanding and tolerance for the rest of the world.

Discussion

Previous scholarship underscores that values are important in GenEd CEs and that institutions seek to integrate these values. For example, Harland and Pickering (2011) argue that undergraduate education:

> Provides a unique experience for students. Their stay is a formative period and is remembered by many as a rite of passage and a time of self-actualization, when they become more autonomous in their learning and thinking. Students refine their values and come to see what values actually mean in a rich and complex environment and they must make decisions about

> many things, including answering seemingly infinitely complex questions about how to live. (p. 14-15)

However, there has been little research showing whether the integration of these values is successful. To address this gap, this study used mixed methods to investigate responses from faculty and students at Boston College about their experiences teaching and learning about values during a general education capstone course. Through triangulation of survey data and faculty focus group themes, we queried not only the presence of values in the course goals but also whether—and how—those values were integrated during class sessions.

While some of the pedagogies and results may seem routine or unsurprising to some readers, many discipline-focused capstones shy away from approaches such as reflection and classroom discussion. In a U.S. survey of CEs based on responses from 291 academic departments, 96.6% of capstone courses were discipline-based, while 69.4 % of the courses used a thesis or independent research paper as the CE (Young et al., 2017). Furthermore, a majority of CEs in US and Canadian biology programs take the form of an independent research paper with little or no emphasis on non-traditional scientific components (Haave, 2015. We suggest that a rethinking of such CE courses, including both classroom delivery and assessment, could lead to a more significant transformative experience for students and a positive impact on society.

First Research Question: Values Integration

Our first research question was "Can faculty and students integrate values into their capstone experience?" While this question's answer may seem obvious, some instructors in some fields believe the answer is a firm 'NO'; and that values are neither important, nor is it possible (or appropriate!) to elicit them in a course. For example, Howcroft and Mercer (2022) showed that a subset of engineering professors felt that empathy was not important to teach to engineers and not possible to teach to engineers.

Our statistically significant survey results provided clear evidence that the answer is YES! In the BCCP, both faculty and students ranked values as the most important aspect of the CE, and when asked to select those value-related outcomes that were affected by the CE, none of the participants selected "no values are affected."

When we investigated specific values, both the survey results (where students selected *thoughtfulness* as the top value, with 95% confidence interval overlapping only *openness*) and the numerous anecdotes provided during the focus groups supported the claim that BCCP students and faculty integrated *thoughtfulness* in two sub-dimensions: *thoughtfulness-reflection* and *thoughtfulness-openness*.

Furthermore, during the focus groups, faculty discussed *openness* at rates second only to *thoughtfulness*. These results were consistent with survey-based student perceptions of which values were most impacted by the CE. Indeed, faculty not only discussed how they integrated ideas of *openness* during their teaching, but they provided numerous anecdotes of how students integrated this value into their future lives. These findings also align with Henscheid (2012), who observed that, "Whether implicitly or explicitly, senior seminar and capstone courses are increasingly designed by establishing values and products of the course" (p. 93). However, this mindful approach to capstone design is not always followed. For example, teaching and assessing values in higher education classrooms is often underemphasized as instructors and students navigate other teaching and research topics and tasks (Harland & Pickering, 2011).

Under-emphasis of (or complete lack of) values-based outcomes can have harmful impacts on students and society at large, especially when considering professional programs. For example, engineers rely almost exclusively on the scientific method as the method of inquiry and scientific

knowledge (Riley, 2008). However, this ideology can lead to insufficient investigation of certain types of information (e.g., empirical data or model results) or insufficient valuing of certain types of information (e.g., Indigenous knowledge). Indeed, in recent research on undergraduate capstone experiences (CEs) engineering students and faculty reported that their courses did not address values such as *openness*, *compassion*, and *self-awareness*, whereas other disciplines (including non-engineering STEM) did report addressing those values (Vale et al., 2020).

We encourage all capstone instructors, GenEd or otherwise, to mindfully integrate values-based learning outcomes in their capstone courses, and we encourage researchers and educators to widely share their approaches for doing so!

Second Research Question: Faculty Methods for Values Integration

Our second research question asked which pedagogical methods achieved values integration. The discussion above posits that integration did in fact occur, so the remaining question was which pedagogy leads to this integration. To answer this question, we turned to the focus group results. It was perhaps unsurprising that the BCCP's pedagogical focus on *reflection* correlates to both faculty and students reporting that *thoughtfulness* was impacted by the BCCP. Similarly, the discussion driven focus of the seminars was likely a factor that encouraged students to build *openness*. Interestingly, the focus group results showed a clear focus on *reflection* and *discussion/discourse* as pedagogical approaches to instilling many different values. Indeed, in all the student integration anecdotes, these two pedagogies appeared as contributing to students building the respective outcomes.

Harvey and Russell-Mundine (2019) argue that "The need for reflective practice is well established in professional disciplines. Reflective practice helps students develop and engage in appropriate professional-client protocols based on a critical examination of theory and their own practice" (p. 797). The interconnected values of *reflection*, *thoughtfulness*, and *discussion/discourse* have been integrated in CEs across several disciplines including engineering (Sepp et al., 2015)), communication (Martin & Strawser, 2017), software development (Ras et al., 2007), nursing (Edwards, 2018), and accounting (Johnson & Halabi, 2011). In engineering, for example, Marsolek and Canney (2016) advocated "weekly progress reflections" throughout the span of a CE (p. 2). The authors identified "key elements" to structure reflective activities, including naming "experiences" of progress on a project, "lenses" such as "disciplinary knowledge" and "action" to ensure that students use reflection to make informed decision independently (p. 2).

Reflection, *thoughtfulness*, and *discussion/discourse* are also essential values of pedagogies informed by Indigenous knowledge that can be accessed to increase efforts to decolonize traditional Western approaches to learning while increasing students' cultural competence (Harvey & Russell-Mundine, 2019; Nguyen-Truong et al., 2018; Risner, 2017; Tsuruda & Shepherd, 2016). As a way of knowing that stands alongside traditional Western rationality, "critical self-reflection is an especially useful decolonizing tool as it asks us to interrogate our assumptions about what knowledge is assigned value in our institutions and why" (Harvey & Russell Mundine, 2019). Critical self-reflection, in its effort to ask questions instead of seeking answers, complements many of the disciplines that rely heavily on Western models of problem-solving.

Differences between Student and Faculty Values

We saw several differences in the values that student and faculty participants believed were influenced by the CE. While there were many possible reasons for these results, the simplest potential explanation was that students may not have selected some values in the survey because they believed they had already exhibited or internalized that value and therefore it was not influenced by the CE.

Future work to elaborate this data could include performing pre- and post-surveys or student focus groups to determine if this hypothesis is correct.

When compared to students, faculty selected *integrity* and *inter-cultural sensitivity* at much higher rates than expected, while they selected *professionalism* at much lower rates than expected. This finding may be partially due to the low sample size in the faculty participant group. We note that the 95% confidence intervals overlapped for almost all the faculty reported value counts, except for *professionalism* (n=1 faculty participant).

We suspect that the discrepancy in *professionalism* may be due to varying interpretations of the word itself. We theorize that students may view professionalism to be related to ideas such as punctuality, decorum, and *integrity*, which they selected at similar rates to *professionalism* (e.g., McCormack et al., 2012). However, faculty may view professionalism in a disciplinary context (e.g., nursing, education, business, etc.; refer to Smith et al., 2020), which, by definition, would not achieve the general education goals of the BCCP. Alternatively, the discrepancy may be due to a lack of clarity on how to teach or assess professionalism. McCormack et al. (2012) noted that a need exists for further studies that address "teaching or assessing student achievement in professional responsibility" (p. 417).

Both *integrity* and *intercultural sensitivity* were selected on the survey at higher rates than expected by faculty as compared to the students. Indeed, faculty members did not discuss either of these values extensively during the focus group discussion, leading to the hypothesis that, while faculty may believe that they are eliciting these values in their CE, they are not doing so in a way that their students are aware of or that they themselves choose to articulate. This possibility may be a good reminder for all instructors to be mindful of the desired outcomes and to ensure that their activities adequately reflect those goals.

Survey Limitations

Because participants were asked what values were "affected" in their CE, it is likely that participants interpreted this term in different ways (e.g., some may have interpreted it as analogous to *assessed*, while others may have interpreted it as analogous to *changed*). A key constraint of the survey was that we limited participants to select five outcomes at most, and we did not ask participants to rank those terms. This constraint could mean that participants may have wanted to select more than five outcomes but could not and instead chose their top analogues, while others may have intentionally selected multiple outcomes that were somewhat analogous (e.g., *empathy* and *compassion*) to highlight their importance.

Additionally, we did not provide definitions of the values in the lists, so participants were likely to interpret the words differently (as discussed above with respect to *professionalism*.)

Finally, overlap could occur between and among outcomes in the three categories. For example, the values of *professionalism* and *career orientation* may subsume or overlap with skills such as *leadership*, *enterprise*, and *technological literacy*. Likewise, the value of *openness* may subsume or overlap with the attitudes of being *curious*, *open-minded*, and *tolerant*. Investigating such overlaps are beyond the scope of this work.

Conclusion

This study used multiple research methods and triangulated data to investigate how faculty integrated— and students perceived—values outcomes in their courses in the Boston College Capstone Program. The richness of this data allowed for a fulsome investigation into the elicitation of values and the associated pedagogies. Such data is rare in the literature. We encourage instructors and administrators to consider implementing a survey asking directed questions regarding values

integration as a means of assessing the success of a capstone course or program, rather than relying on traditional student evaluations of teaching as the only instrument.

Our results demonstrate that the integration of reflection and discussion pedagogies has the potential to influence a variety of values-based outcomes, including *thoughtfulness*, *openness*, and *responsibility*. These pedagogies can easily be adopted by instructors in any course context: GenEd, disciplinary, or otherwise. Though challenging, these pedagogies can even be adopted in large classroom settings that use reflective frameworks (e.g., Keshwani & Adams, 2017 and Whalen & Paez, 2019) and creative application of active learning discourse techniques.

Our results demonstrate a richness of opportunity that can inform *all* capstone courses to move beyond the synthesis and application of disciplinary learning and toward a broader and more fundamental approach to teaching values in post-secondary education. Especially for professional programs such as health and engineering, the inclusion of values is critical to educating responsible and ethical practitioners. However, values have often been assumed to be somehow implicit in the curricula, and it has become increasingly obvious that values need to be made explicit. As such, we encourage institutional leaders and capstone experience instructors to consider integrating these pedagogies into every capstone experience, with mindful attention to the associated values that they seek to instill. Indeed, we suggest that this study offers instructors and administrators a lens through which to re-evaluate and possibly reimagine disciplinary capstone experiences that are historically situated almost solely in the disciplinary knowledge and skills required of the graduate professional. Paying greater attention to values in all capstone courses might enable students to be educated not just *in* their discipline, but *beyond* it.

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Appendix

Appendix A: Categories and Associated Outcomes.

Values	Skills/Competencies	Attitudes
Thoughtfulness	Critical thinking	Self-aware
Integrity	Communication - written	Open-minded/ tolerant
Inter-cultural sensitivity	Communication - verbal	Societally aware
Responsibility	Lifelong learning	Insightful
Empathy	Interpersonal skills	Spiritual
Professionalism	Problem solving	Concerned for the well-being of others
Compassion	Critical reading	Responsible
Openness	Personal and organizational management	Curious
Citizenship	Teamwork	Resilient/ Determined
Ethical sensitivity	Information literacy	Motivated/ Enthusiastic
Career orientation	Research	Honest
		Independent/ Self-confident
		Professional

Appendix B: Interview Questions for Faculty Focus Groups.

Below is a list of questions and prompts that facilitators had available to help ensure conversation. Not all questions/prompts were used.

1. Tell us a little about your capstone course.
    - Is the course within or outside your discipline/program?
    - Does it refer to a single discipline or is it inter-disciplinary? What are these disciplines/programs?
    - Is the course required/compulsory or elective/optional? Do you agree with this and why?
    - What level of input have you had in designing the course and defining its purpose/goals?
2. What is the purpose of the course? What do you hope your students will get out of it?
3. Why do you pursue this purpose?
    - (How) do you think the course fits within the institutional context? (Department; School; University missions)
    - (How) do you think the course fits within wider educational/employability/other contexts?
4. Do you think that your / the course goals align with those of the students?
5. Are the course goals appropriate or are any missing that you deem important?
    - What goals are missing and why do you think this is?

6. What **values, attitudes**, **skills or competencies** are you hoping the course will instill/develop in your students?

(By 'skills/competencies' we mean "the broad range of abilities necessary to perform well in university, employment or society, with results of acceptable quality")

- If they don't recognize this characteristic simply ask why not. Then omit the questions below.
- How are you hoping to achieve this? Can you give an example?
- How do you teach and assess to instill/develop these skills/competencies in your students? Is this different from other courses? If so how?
- Do you think the course develops these skills/competencies successfully? Briefly explain your answer.
- (How) are these skills/competencies relevant for a student's discipline?
- …. for a student's future career?
- ….. to the student as a person?

7. Which of skills/competencies, values, attitudes and knowledge are most important to develop in your students through the course? Why?
    - Is anything missing from this list? If so, what?
8. What could/would you do to make this course more valuable for your students?
    - What would you do as an instructor/teaching team?
    - … at departmental level?
    - … at school level?
    - … at university level?
9. What could the students do to make the course more valuable for themselves?
10. Is there anything else you would like to tell us about the reasons for, operation of, or outcomes of the capstone course?

Appendix C: Definitions of Values.

The following definitions were not provided on the survey but were used as a foundation for discussion for the purposes of thematic coding. The definitions are taken from the *Merriam-Webster Dictionary* online.

- **Openness**— "Characterized by ready accessibility and usually generous attitude: such as … willing to hear and consider or to accept and deal with; responsive, open to an offer, open to suggestion; . . . accessible to the influx of new factors . . ."
- **Empathy**— "Understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another of either the past or present without having the feelings, thoughts, and experience fully communicated in an objectively explicit manner"
- **Ethics**— "A set of moral principles; a theory or system of moral values; the principles of conduct governing an individual or a group"
- **Compassion**— "Sympathetic consciousness of others' distress together with a desire to alleviate it"
- **Thoughtfulness (Reflection)**— "Characterized by careful reasoned thinking"
- **Thoughtfulness (Others)**— "Given to or chosen or made with heedful anticipation of the needs and wants of others"
- **Responsibility**— "Liable to be called to account as the primary cause . . . able to answer for one's conduct and obligations"
- **Integrity**— "Firm adherence to a code of especially moral or artistic values"
- **Career**— "A field for or pursuit of consecutive progressive achievement especially in public, professional, or business life"
- **Professionalism**— "The conduct, aims, or qualities that characterize or mark a profession or a professional person"; a professional is defined as "characterized by or conforming to the technical or ethical standards of a profession; exhibiting a courteous, conscientious, and generally businesslike manner in the workplace"
- **Inter-cultural sensitivity** – On this point, we combined Merriam-Webster's entries for "sensitivity" and "inter-cultural", hence "awareness of the needs and emotions of others" and "occurring between or involving two or more cultures"
- **Citizenship**— "the quality of an individual's response to membership in a community"

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