

# Attitudes about Cybersecurity Articulation Agreements and Transfer Students: A Statewide Survey of Faculty Members and Advisors

Brian K. Payne, Old Dominion University  
Tancy Vandecar-Burdin, Old Dominion University  
Daniela Cigularova, Old Dominion University

*In this study, cybersecurity faculty and academic advisors from community colleges and 4-year universities in the southeast region of the United States completed a survey assessing attitudes about and support for articulation agreements and related transfer policies. Hypothesizing that professional structures shape attitudes and experiences, the researchers conducted an exploratory quantitative study with primarily descriptive analyses. The results reveal differences in attitudes between community college and 4-year stakeholders and between faculty and academic advisors. The results of this study are discussed in relation to faculty and advisor training and communication.*

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A significant number of students transfer from community colleges to 4-year institutions yearly (U.S. Department of Education, 2021). They often face barriers when transferring including: credits not transferring (Giani, 2019; Monk-Turner, 2016), culture shock, (Elliott & Lakin, 2021; Rhine et al., 2000; Smith et al., 2022), confusing new norms and expectations (Harrick & Fullington, 2019; Schlossberg, 2020), and misinformation from faculty and other institutional personnel (Boeck, 2022; Schwehm, 2017). Transfer-friendly practices help address these challenges. Specifically, articulation agreements clearly stipulating transfer credits can help students transfer between institutions in a cost-effective and timely manner (Payne et al., 2021). While these agreements do support student success (Hurley & Mitchell, 2021; Jaeger et al., 2015; Wallace & Falla, 2020), few students take advantage of them (Boatman & Soliz, 2018).

Because implementing articulation agreements requires contributions from community college and 4-year institution faculty and advisors, their success requires collaboration between these groups; if not, differing expectations could inhibit an articulation agreement's success. To date, few studies have explored how higher education

professionals view articulation agreements and other transfer practices, or how much professional and institutional factors shape those views (Grote et al., 2020, 2021). This study explores how cybersecurity faculty members and advisors in one state view articulation agreements and transfer-friendly practices in a vertical transfer framework. It examines whether different groups of professionals engage in different behaviors when educating or serving transfer students. This exploratory quantitative study addresses the following research questions:

1. Do faculty and academic advisors agree about the value of articulation agreements and report comparable experiences when advising transfer students?
2. Do community college representatives and 4-year representatives agree about the value of articulation agreements and report comparable experiences in advising transfer students?

Addressing these questions will reveal how to facilitate transfer student success, as identifying perceptions about articulation agreements and transfer-friendly policies will help to determine whether changes are needed to ensure that all stakeholders achieve the same goals.

## Literature Review

Community colleges hold one of the keys to diversifying the STEM workforce by providing pathways to a 4-year degree (Packard & Jeffers, 2013; Snyder & Cudney, 2017; Varty, 2022). Community colleges' potential to achieve successful transfer practices rests on three pillars: awareness about transfer-friendly policies, communication, and collaboration (Bautsch, 2013; Grote et al., 2021; Schudde et al., 2020). Research on these pillars suggests a need to explore the intersections between them because the success of transfer-friendly practices rests on the behaviors, attitudes, and expertise of all faculty and advisors charged with communicating policies and collaborating to help students succeed.

### Awareness about Transfer Friendly Policies

Articulation agreements and transfer policies and practices are “essential to improving college completion” (Bautsch, 2013, p. 4). Data from the National Center for Educational Statistics (NCES) shows that articulation agreements can increase the number of bachelor’s degrees awarded (Stern, 2016). Additional transfer-friendly policies—such as specialized advising, developmental courses, and structured pathways—also improve transfer student success (Miller, 2013) and advance equity and access (D’Amico et al., 2021). Articulation agreements can enhance the diversity of bachelor’s degree holders and the talent pipeline in various fields (Montague, 2012). For these practices to work, advisors and faculty must understand them (Taylor, 2019) and become “content experts.”

### Communication

Regarding communication, articulation agreements and other transfer policies can be better communicated to students (Schudde et al., 2020). Taylor (2019) explored 100 articulation agreements and found that just 13 were written at the reading level of first-year community college students, while 69 were written at or above the reading level of college seniors. Taylor concluded that “articulation agreements between 2- and 4-year institutions are largely unreadable by the average college student” (p. 67). Stern (2016) found that while bachelor’s degree attainment rates positively relate to articulation agreements, transfer rates do not; in other words, articulation agreements do not impact transfer decisions, but still “the visibility of these agreements...is of greatest importance” (p. 365). Such visibility relies on collaboration between academic advisors and faculty at all institutions.

Also, advisors and faculty need to convey a wide range of transfer-related topics to improve student confidence. Kates (2010) notes that faculty activities at community colleges (i.e., introducing students to peer-reviewed research, using syllabi content, etc.) help students succeed at 4-year institutions. Advisors in both settings “serve in a critical role of building students’ self-efficacy for transfer” (Lukszo & Hayes, 2020, p. 31) and help develop “transfer student capital” (Hayes et al., 2020, p. 49). While academic advisors help student success, Hart-Baldrige (2020) identified numerous challenges that faculty advisors face including inequitable workload distributions, understanding advising software,

the separation of advising from learning processes, and vague expectations. Faculty may not fully understand the information necessary to maximize transfer student success. For example, a study at one private university found that “faculty were generally unaware of all the intricacies of transfer policy and how to best help community college students navigate the process” (Hyatt & Smith, 2020, p. 407). Such findings suggest a need for collaboration.

### Collaboration

Regarding collaboration, a team approach perhaps best supports transfer students (Bowles et al., 2020). Strong relationships between faculty and advisors in community colleges help students understand the transfer process (Packard & Jeffers, 2013) so long as parties at both institutions work closely to ensure they are prepared to serve transfer students. Expressing this need for an “equal partnership” (p. 288) between both institutions, Montague (2012) emphasized that “cooperative collaboration among knowledgeable representatives is essential” (p. 287). An articulation agreement’s effectiveness hinges on successful collaboration between community college and university personnel who implement articulation agreement policies (Grote et al., 2021).

One example of collaboration includes faculty designing an agreement’s curricula content with advisors communicating the content to students (Grote et al., 2021). Hodges and Salis (2016) noted that collaboration allows representatives to identify and eliminate transfer barriers. For collaboration to happen, institutions must promote cooperation between transfer stakeholders—for example, one group of institutions hosts four meetings a year and annual tours for faculty from both schools to connect faculty with one another (Edinborough et al., 2014). Of course, articulation agreements serve as only one part of an institution’s transfer policy framework (Taylor & Jain, 2017). Their success lies, in part, on the efforts of academic and faculty advisors who communicate policies and support students in their transfer planning process (Fincher et al., 2014).

### Hypotheses

Sociological theory about subcultures and academic advising studies suggests that various groups potentially hold differing views about articulation and transfer policies. Subcultural

approaches point to the different values and beliefs of specific groups and how they result in behavioral patterns unique to a subculture (Williams, 2011). This perspective illustrates how faculty experience advising differently than professional advisors (Hart-Baldrige, 2020) and frames how community college and 4-year professionals fulfill different roles (Zambroski & Freeman, 2004). Because of these different structures, attitudes about and experiences with articulation agreements and transfer-friendly practices may differ. To determine such differences, this study tested the following four hypotheses:

1. Faculty and advisors will report different types of experiences working with transfer students.
2. Faculty and advisors will report different attitudes about articulation agreements.
3. Community college professionals and university professionals will describe differing experiences working with transfer students.
4. Community college professionals and university professionals will report different attitudes about articulation agreements.

### Method

To address these questions, faculty and academic advisors working with cybersecurity students at 4-year institutions and community colleges in a southeastern state participated in a web-based survey in the 2020 fall semester. Survey distribution was based on purposeful sampling methods. *Purposeful sampling* allows for the identification and selection of information-rich cases for the most effective use of limited resources (Patton, 2002), which enabled researchers to focus on individuals who are knowledgeable about or experienced with our topic (Creswell & Plano Clark, 2011). The survey was emailed to faculty and academic advisors at both institutions who were collaborating on a grant to evaluate transfer pathways. Members of the State Committee on Transfer also received the survey and were encouraged to share it with others involved in the project.

### Measures

A team of community college and 4-year faculty and advisors developed the survey. Items

assessed attitudes (e.g., agreement with different statements) and frequencies of different behaviors. Respondents indicated their level of agreement on a series of statements about working with transfer pathways/articulation agreements, including:

- I am very familiar with the way that the articulation agreements work.
- Articulation agreements bring significant value to our students.
- Developing and updating articulation agreements requires significant effort.
- The technical nature of cybersecurity makes it harder to advise students about their transfer options.
- I would be willing to meet a couple of times a semester with other cybersecurity faculty and advisors from other institutions to discuss our academic programs.
- Community college students will learn more about transfer processes and policies from other students than they would learn from faculty.
- I know who to contact at 4-year universities when I have questions about transfer processes.
- I am satisfied with the communication I receive about my students after they transfer.

The last two questions were given only to community college respondents because they did not apply to 4-year respondents. Response options included *strongly agree*, *agree*, *disagree*, and *strongly disagree*. When differences were considered between groups, the *strongly agree* and *agree* categories were combined as were the *disagree* and *strongly disagree* categories.

Respondents also indicated how often they believed each of the following behaviors occurred:

- I spend time talking with students about transferring to other institutions.
- My students who transfer receive adequate transfer advising at the institution they transfer to.
- I discuss the reverse transfer option with students.
- I contact representatives from 4-year universities to talk about transfer options or coursework at those institutions.

- Students tell me that they are losing too many credits when they transfer to a 4-year institution.
- Our students can transfer their credits relatively easily with the articulation agreements in place.

Options for respondents included *never, rarely, sometimes, often, and always*. For purposes of bivariate analyses, when differences between the groups were considered, we combined *never* and *rarely* into one category and *often* and *always* into another. *Sometimes* was not combined with other options. Sample size and analytical procedures drove decisions about collapsing categories.

**Participants**

A total of 75 respondents participated (17 advisors and 58 faculty). Table 1 shows respondents' characteristics. Because a purposive sampling design was used, we were unable to estimate response rates or compare our sample with the broader sampling frame. Respondents had been working in their roles between 2 and 400 months; the average was 113 months (or about 9.4 years). More than one-third (38.7%) had doctoral degrees, 58.6% had master's degrees, and 2.7% had bachelor's degrees. About 57.3% (n = 43) worked at a community college and 42.7% (n = 32) worked at a 4-year institution. Half of the faculty had doctoral degrees; half had master's degrees. Each of the university advisors had master's degrees, while 88.2% (n = 15) of the community college advisors did. The average length of employment was highest among community college faculty ( $\bar{x}$  = 134.0 months) and university faculty ( $\bar{x}$  = 113.3 months), while the average length of employment was lower for community college advisors ( $\bar{x}$  = 87.8 months) and university advisors ( $\bar{x}$  = 80.0 months).

Because faculty came from various institutions, their advising roles varied; typically community college faculty focus on teaching and advising while 4-year university faculty additionally incorporate research (Hovekamp, 2005).

**Analysis**

Three types of analyses were conducted and were determined by level of measurement, statistical purpose, and sample size. *Univariate descriptive* analyses provided an overall description of the attitudes and behaviors of the sample. *Crosstabulations* tested the stated hypotheses and

**Table 1. Respondent Characteristics**

<b>Participants (n=75)</b>		
	<b>n</b>	<b>%</b>
<b>Length of Time in Role</b>		
2 Years or less	16	21.3
More than 2 years to 5 years	20	26.7
More than 5 years to 10 years	12	16.0
More than 10 years	27	36.0
<b>Highest Degree</b>		
Bachelor's degree	2	2.5
Master's degree	44	58.7
Doctorate degree	29	38.7
<b>Institutional Affiliation</b>		
Community college	43	57.3
4-year institution	32	42.7
<b>Faculty Member Characteristics (n=58)</b>		
<b>Length of Time in Role</b>		
2 years or less	11	19.0
More than 2 years to 5 years	15	25.9
More than 5 years to 10 years	9	15.5
More than 10 years	23	39.6
<b>Highest Degree</b>		
Bachelor's degree	0	0.0
Master's degree	29	50.0
Doctorate degree	29	50.0
<b>Institutional Affiliation</b>		
Community college	30	51.7
4-year institution	28	48.3
<b>Advisor Characteristics (n=17)</b>		
<b>Length of Time in Role</b>		
2 years or less	5	29.4
More than 2 years to 5 years	5	29.4
More than 5 years to 10 years	3	17.7
More than 10 years	4	23.5
<b>Highest Degree</b>		
Bachelor's degree	2	11.8
Master's degree	15	88.2
Doctorate degree	0	0.0
<b>Institutional Affiliation</b>		
Community college	13	76.5
4-year institution	4	23.5

examined differences between groups. In some cases, small cell sizes using 2 by 2 tables required the use of Fisher's Exact Test to determine whether differences existed (McDonald, 2014). In other cases, the cell sizes were large enough for the authors to report the results of Chi Square tests. When comparing across multiple groups and categories for the behavioral measure, an

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**Table 2.** Faculty Members' Versus Advisors' Perceptions of Articulation Agreements

Please indicate your level of agreement with the following statements:	Faculty Members		Advisors	
	Agree, n (%)	Disagree, n (%)	Agree, n (%)	Disagree, n (%)
I am very familiar with the way that the articulation agreements work.*	39 (68.4)	18 (31.6)	16 (100.0)	0 (0.0)
Articulation agreements bring significant value to our students.	54 (94.7)	3 (5.3)	16 (100.0)	0 (0.0)
Developing and updating articulation agreements requires significant effort.	54 (93.1)	4 (6.9)	16 (100.0)	0 (0.0)
<i>I am satisfied with the communication I receive about my students after they transfer.</i>	8 (27.6)	21 (72.4)	6 (54.5)	5 (45.5)
I would be willing to meet a couple of times a semester with other cybersecurity faculty and advisors from other institutions to discuss our academic programs.	5 (8.6)	53 (91.4)	16 (100.0)	0 (0.0)
Community college students will learn more about transfer processes and policies from other students than they would learn from faculty.	29 (50.9)	28 (49.1)	7 (43.8)	9 (56.2)
<i>I know who to contact at four-year universities when I have questions about transfer processes.**</i>	13 (44.8)	16 (55.2)	12 (100.0)	0 (0.0)

Note. Italicized items were asked only of those working at community colleges.

\*Fisher's Exact Test=.008

\*\*Fisher's Exact Test=.001

analysis of variance was conducted and means between groups reported, as comparing multiple categories across four groups was infeasible given the study's sample size.

### Results

Overall, respondents held favorable attitudes about agreements and pathways processes, though community college faculty and advisors expressed some concerns regarding communication (i.e., how students are doing after they transfer or who to contact at 4-year institutions with questions). More than 90 percent of respondents agreed or strongly agreed that articulation agreements bring significant value to their students (95.9%); that developing and updating agreements requires significant effort (94.7%); and that they would be willing to meet with faculty/advisors from other institutions to discuss academic programs (92%). For community college respondents, 63.4% were unsatisfied with the communications they receive about their students after they transfer, and more than one-third (38.1%) reported that they do not know who to contact at 4-year universities when unsure about transfer processes.

Survey respondents were asked to indicate how often they believe certain events occur or how often they do certain things related to helping transfer students. About one-third (33.8%) indicated that they rarely or never spend time talking with students about transferring, and more than half (53.5%) indicated that they rarely or never discuss reverse transfer options. Most (83.6%) indicated that their transfer students receive adequate advising at their new institution (i.e., those responding *sometimes*, *often*, or *always*), while most respondents (84.7%) indicated that their students could transfer credits relatively easily with the current articulation agreements. However, 58.4% indicated that students report that they lost too many credits after transferring to a 4-year institution (at least "sometimes"). Most community college respondents (57.1%) indicated that they at least sometimes needed to contact 4-year institution representatives about transfer options.

A series of crosstabulations tested our hypotheses to determine whether differences existed between the different groups (see Tables 2–5) and revealed moderate support for hypotheses 1 and 3. Specifically, professionals from different

**Table 3.** Faculty Members’ Versus Advisors’ Perceptions of Advising-Related Behaviors

Please indicate how often you believe each item occurs:	Faculty Members			Advisors		
	Rarely/ Never, n (%)	Sometimes, n (%)	Often/ Always, n(%)	Rarely/ Never, n (%)	Sometimes, n (%)	Often/ Always, n (%)
I spend time talking with students about transferring to other institutions.*	23 (40.4)	19 (33.3)	15 (26.3)	1 (12.5)	1 (12.5)	12 (75.0)
My students who transfer receive adequate transfer advising at the institution they transfer to.	11 (19.6)	25 (44.6)	20 (35.8)	1 (6.3)	6 (37.4)	9 (56.3)
I discuss the reverse transfer option with students.	31 (56.4)	17 (30.9)	7 (12.7)	7 (46.7)	2 (13.3)	6 (40.0)
I contact representatives from four-year universities to talk about transfer options or coursework at those institutions.	16 (55.2)	8 (27.6)	5 (17.2)	2 (16.6)	5 (41.7)	5 (41.7)
Students tell me that they are losing too many credits when they transfer to a four-year institution.	22 (40.0)	20 (36.4)	13 (23.6)	7 (43.8)	7 (43.8)	2 (12.5)
Our students are able to transfer their credits relatively easily with the articulation agreements that are in place.**	11 (20)	21 (38.2)	23 (41.8)	0 (0.0)	3 (18.8)	13 (81.2)

Note. \*Chi Square = 12.72, p=.002.

\*\*Chi Square = 8.39, p=.014

occupational structures had varying experiences with and attitudes about transfer-friendly strategies, while different institutional structures impacted experiences but not attitudes.

Table 2 shows the differences between faculty and advisors regarding their perceptions about articulation agreements and transfer pathways, as do Tables 3–5 (via 2-by-2 tables). Two differences

**Table 4.** Community College Versus University Respondents’ Perceptions of Articulation Agreements

Please indicate your level of agreement with the following statements:	Community College		University	
	Agree, n (%)	Disagree, n (%)	Agree, n (%)	Disagree, n (%)
I am very familiar with the way that the articulation agreements work.	34 (81.0)	8 (19.0)	22 (68.7)	10 (31.3)
Articulation agreements bring significant value to our students.	42 (100.0)	0 (0.0)	29 (90.6)	3 (9.4)
Developing and updating articulation agreements requires significant effort.	41 (95.3)	2 (4.7)	30 (93.7)	2 (6.3)
I would be willing to meet a couple of times a semester with other cybersecurity faculty and advisors from other institutions to discuss our academic programs.	41 (95.3)	2 (4.7)	28 (87.5)	4 (12.5)
Community college students will learn more about transfer processes and policies from other students than they would learn from faculty.	17 (40.5)	25 (59.5)	18 (56.2)	14 (43.8)

**Table 5.** Community College Versus University Officials' Perceptions of Advising-Related Behaviors

Please indicate how often you believe each item occurs:	Community College			University		
	Rarely/ Never, n (%)	Sometimes, n (%)	Often/ Always, n (%)	Rarely/ Never, n (%)	Sometimes, n (%)	Often/ Always, n (%)
I spend time talking with students about transferring to other institutions.*	4 (9.5)	13 (31.0)	25 (59.5)	21 (65.6)	8 (25.0)	3 (9.4)
My students who transfer receive adequate transfer advising at the institution they transfer to.**	2 (4.8)	21 (50.0)	19 (45.2)	10 (32.3)	10 (32.3)	11 (35.4)
I discuss the reverse transfer option with students.	20 (48.8)	10 (24.4)	11 (26.8)	18 (60.0)	9 (30.0)	3 (10.0)
Students tell me that they are losing too many credits when they transfer to a four-year institution.***	12 (28.6)	21 (50.0)	9 (21.4)	18 (60.0)	6 (20.0)	6 (20.0)
Our students are able to transfer their credits relatively easily with the articulation agreements that are in place.	5 (11.9)	13 (31.0)	24 (57.1)	6 (20.0)	11 (36.7)	13 (43.3)

Note. \*Chi Square = 29.21,  $p = .000$

\*\*Chi Square = 9.94,  $p = .007$

\*\*\*Chi Square = 8.37,  $p = .015$

emerged. First, all the advisors were familiar with how articulation agreements work, but nearly a third of faculty indicated they were unfamiliar with them (Fisher's Exact Test = .008). Second, community college faculty were less likely than community college advisors to indicate knowledge of who to contact at the 4-year university with questions about transfer processes. All the community college advisors indicated they knew who to contact, while more than half of the community college faculty indicated that they did not (Fisher's Exact Test = .001).

Table 3 shows how often faculty and advisors reported engaging in behaviors related to articulation agreements and transfer policies. Two differences arose. First, compared to faculty, advisors were more likely to report talking with students about transferring *often* or *always* (Chi Square = 12.72,  $p = .022$ ). Second, advisors were more likely to report that students *often* or *always* transferred credits relatively easily, while faculty were more likely to report that their students *rarely/never* or *sometimes* transferred credits easily (Chi Square = 8.39,  $p = .014$ ). Table 4 compares those working at 4-year institutions to those at community colleges, with Chi-Square analyses revealing no differences between these respondents, thereby suggesting that

respondents agreed about articulation agreements and transfer pathways across institutions.

Table 5 shows how often community college and university respondents reported different behaviors related to articulation agreements and transfer pathways. Three significant differences appeared. First, community college representatives more often indicated that they *often* or *always* spent time talking with students about transfer than 4-year representatives did (Chi Square = 29.21,  $p = .000$ ). Second, community college representatives more often reported that their students *often* or *always* received adequate transfer advice at their transfer institution than did respondents from 4-year institutions. In fact, nearly a third of 4-year institution respondents said their students *rarely/never* received adequate advice (compared to under 5% of community college respondents). Third, community college respondents were more likely to report that students told them they were losing too many credits when transferring. More than 70% of community college respondents said that students *sometimes*, *often*, or *always* said they lost too many credits when transferring, compared to 40% of respondents from 4-year institutions (Chi Square = 8.37,  $p = .015$ ).

**Table 6.** Attitudes about Articulation Agreements and Transfer Pathways, Agree/Strongly Agree by Institution and Role

Please indicate your level of agreement with the following statements:	Community	Community	University	University
	College Faculty Members, n (%)	College Advisors, n (%)	College Faculty Members, n (%)	College Advisors, n (%)
I am very familiar with the way that the articulation agreements work.	21 (72.4)	13 (100.0)	18 (64.3)	4 (100.0)
Articulation agreements bring significant value to our students.	29 (100.0)	13 (100.0)	25 (89.3)	4 (100.0)
Developing and updating articulation agreements requires significant effort.	93.3 (28)	100.0 (13)	26 (92.9)	4 (100.0)
I would be willing to meet a couple of times a semester with other cybersecurity faculty and advisors from other institutions to discuss our academic programs.	29 (96.7)	12 (92.3)	24 (85.7)	4 (100.0)
Community college students will learn more about transfer processes and policies from other students than they would learn from faculty.	13 (44.8)	4 (30.8)	15 (55.6)	3 (75.0)

We also examined respondents' occupational roles and if institutions impacted attitudes and experiences (see Tables 6 and 7). Crosstabulations assessed the attitudes of the four groups. Because

of sample size and the aim to compare the four groups across three response categories, an analysis of variance was conducted to assess the frequency of different behaviors. No significant

**Table 7.** Transfer Actions with Students by Institutional and Professional Roles\*

Please indicate how often you believe each item occurs:	Community	Community	University	University
	College Faculty Members, (n=30), x (s.d.)	College Advisors, (n=13), x (s.d.)	College Faculty Members, (n=28), x (s.d.)	College Advisors, (n=4), x (s.d.)
I spend time talking with students about transferring to other institutions.	3.48 (.95)	4.38 (.65)	2.21 (.96)	2.75 (1.71)
My students who transfer receive adequate transfer advising at the institution they transfer to.	3.41 (.76)	3.85 (.80)	2.89 (1.12)	3.50 (1.30)
I discuss the reverse transfer option with students.	2.38 (1.15)	3.33 (1.37)	2.15 (1.01)	1.7 (1.50)
Students tell me that they are losing too many credits when they transfer to a four-year institution.	3.00 (1.04)	2.69 (.63)	2.31 (1.22)	2.00 (1.41)
Our students are able to transfer their credits relatively easily with the articulation agreements that are in place.	3.31 (.93)	4.08 (.64)	3.19 (1.20)	4.00 (.82)

Note. \*Results show mean differences based on a scale using categories of never = 1, rarely = 2, sometimes = 3, often = 4, and always = 5.



differences arose between institutions or occupational roles. However, a few trends are worth highlighting. Less than two-thirds of university faculty reported being familiar with how articulation agreements work, compared to all the community college and university advisors and nearly three-fourths of community college faculty (see Table 6). Only a small number of university faculty disagreed with the statement that articulation agreements bring significant value. Also, when compared to the other groups, university faculty responded that students were seldom able to transfer their credits relatively easily, and that students who transferred received adequate transfer advising less often (see Table 7).

### Discussion

This study explored how faculty and advisors from community colleges and 4-year institutions viewed articulation agreements and transfer pathways and revealed mixed support for the four hypotheses. When predicting different attitudes among (a) faculty and advisors (H1) and (b) community college and university professionals (H3), no support was found. When predicting different experiences with transfer students among (a) faculty and advisors (H2) and (b) community college and university professionals (H4), some support was found, showing that experiences with agreements and transfer students varied across populations.

Some differences were clear. Compared to faculty, advisors were more familiar with how articulation agreement processes worked. They were more likely to know who to contact if they had questions about transfer, spent more time talking about transferring, and reported more favorable perceptions of how credits transferred. When differences between institutions were considered, community college representatives spent more time talking with students about transfer options, while more 4-year institution respondents believed that students received inadequate transfer advice. Overall, respondents appeared to vary on behavioral domains more so than attitudinal domains. In many ways, these findings are encouraging. Consider the overwhelming opinion that articulation agreements are of value, the recognition that developing the agreements takes a considerable amount of time, and the expressed willingness of faculty and academic advisors to meet with counterparts.

Collectively, these findings have important implications for the three pillars of successful articulation agreements and transfer policies: awareness, communication, and collaboration. In terms of awareness, findings indicate that faculty reported being less familiar with articulation agreements, which suggests a need for training about serving transfer students successfully. The presence of an advanced degree did not equate to faculty being able to advise transfer students effectively (Powers & Wartalski, 2021). Unlike advisors, many faculty did not know who to contact for assistance; therefore, training should be tailored to specific types of advisors, with deliberate efforts to familiarize faculty with transfer curriculum pathways, relevant admission policies, and pretransfer advising resources. Our findings also point to the need to provide training about reverse transfer, as well as strategies to reduce credit loss or to develop and implement articulation agreements.

Our finding that some respondents rarely talked about transfer or articulation suggests the need to better integrate communication into future advising practices and training. Specifically, the need for two types of communication surface from our findings—communication with students and communication between institutions. For students, given that we found faculty spent less time talking about transfer, it is important that they be provided with information and training necessary to engage in such conversations. Reaffirming this finding, one study found that students' perceptions were critical to transfer decisions, with concerns about rigor, isolation, and assorted demands limiting the numbers of students transferring (Hearn, 2018). Here, faculty and advisors alike are in prime positions to sway those perceptions.

Communication between institutions is also critical for the success of articulation agreements and transfer practices. One third of community college faculty did not know who to contact at a 4-year institution, which suggests communication barriers. Community college professionals were more likely to believe that students lost too many credits when they transferred, and university professionals were more likely to believe that students received poor transfer advising. These findings point again to communication barriers between the groups. Getting professionals from community colleges and 4-year institutions to communicate about the value and reality of articulation agreements should promote better understanding about how to serve transfer students.

Because faculty and advisors need to work together in successfully implementing articulation agreements and transfer strategies, training should be both interprofessional and interinstitutional. Part of this training should focus on federal (e.g., FERPA) and institutional regulations about what types of information can be shared. Training academic advisors and faculty in joint programs would allow both groups to understand the roles, beliefs, and experiences of their counterparts, while bringing together community college and 4-year partners for joint training could improve working relations between institutions. Our research finds that more than 90% of respondents expressed a willingness to meet regularly to discuss their academic programs. A holistic approach to transfer advising training will ultimately benefit students or, in the words of one author, “articulation takes a village” (Patton, 2017, p. 31). All members of that village must have the knowledge, skills, and abilities to serve transfer students.

This study had limitations. First, the universal problem of nonresponse bias could mean that those who responded tended to be more supportive of transfer students. Those not responding possibly have quite different attitudes. Unfortunately, we were not able to assess nonresponse rates. Our study was limited to one state, so our analysis did not extend into specific demographic or situational factors that might impact perceptions about transfer pathways. These findings may also have more to do with roles assigned to faculty and advisors at different institutions than with external factors, which suggests that differences between faculty and advisors at different institutions may have more to do with normative expectations rather than training, preparation, or other variables.

Finally, focusing on faculty from the same field has advantages and disadvantages. One advantage is that articulation agreements and transfer pathways require collaboration and work between faculty from similar academic programs (Forster-Cox et al., 2016; Grote et al., 2020, 2021; Hodges & Salis, 2016; Littlefield & Mattes, 2020). Thus, including a sample of faculty from cybersecurity (or cybersecurity-related fields) allows us to determine whether differences exist between 2- and 4-year university faculty who serve the same students. A disadvantage of this limit is that we were unable to explore disciplinary differences. Still, this research reveals much about transfer pathways between community college and 4-year institutions within one field.

More research is warranted, both quantitative and qualitative, regarding the disciplinary orientation of faculty members and the potential influence on perceptions about transfer pathways. Faculty admitted to knowing less about certain aspects of articulation agreements and transfer pathways, so future research should focus on these knowledge deficiencies to help structure advising trainings. Future research should also examine why faculty members or advisors experience differing attitudes about articulation agreements and transfer strategies. Are these differences traceable to different academic preparations, different responsibilities, or a difference in values and beliefs? Identifying the nature of such differences will help to suggest additional strategies to ensure that stakeholders can collaborate to assist transfer students. Finally, this study explored attitudes and beliefs within a vertical transfer process, but there are other types of transfers to consider (Spencer, 2021; Taylor & Jain, 2017). Future research should gauge how other types of transfer (e.g., reverse transfer, lateral transfer, swirling, etc.) are perceived by faculty and advisors and whether stronger partnerships are needed to support those students. Given the estimated 38% of students who transfer (U.S. Department of Education, 2021), it is imperative that those working with transfer students understand transfer-friendly practices, communicate with one another and students about transfer practices, and collaborate to promote transfer student success.

## Conclusion

In focusing on how cybersecurity advisors and faculty perceive articulation agreements and the transfer process, this study found that while some differences exist between community college and 4-year stakeholders as well as advisors and faculty, all groups are committed to the value of articulation agreements and to working together to improve students’ transfer process. Differences potentially stem from traditional roles assigned to faculty and advisors at their respective institutions and point to training opportunities. In general, advisors seemed more attuned with articulation agreement policies and practices. As communicators, advisors talked more often to students about transferring and more-often reported knowing who to contact at other institutions for transfer-related questions. As content experts, advisors were more likely to report knowing how articulation agreements worked. Now the task at hand is to identify

strategies to help all stakeholders improve in their efforts in the implementation of transfer-friendly processes.

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#### Authors' Notes

*This research is supported in part by the National Science Foundation under grant DGE-1914613.*

*Dr. Brian K. Payne is vice provost of academic affairs and professor of sociology and criminal justice at Old Dominion University. He oversees the Center for Academic Advising Administration and Transfer Initiatives, Center for High Impact*

*Practices, School of Cybersecurity and other student success units. He has published eight books and more than 150 scholarly journal articles. His research interest includes a focus on student success and effective pedagogy. Dr. Payne may be reached at [bpayne@odu.edu](mailto:bpayne@odu.edu)*

*Dr. Tancy Vandecar-Burdin is the director of the Social Science Research Center (SSRC) at Old Dominion University. Dr. Vandecar-Burdin has more than 20 years of experience with survey research, data collection, data analysis, program evaluation, and qualitative methods. She has managed research and evaluation activities on a variety of topics including college student experiences with experiential learning, college student daily travel patterns, interpersonal violence, nursing home quality, the effectiveness of early intervention services, implementation fidelity of positive behavioral interventions for public school students, and the quality of life in the Hampton Roads (southeastern Virginia) area.*

*Daniela Cigularova serves as the executive director of Advising Administration and Transfer Initiatives at Old Dominion University. She works with academic departments, faculty, SEES, and academic affairs units to enhance enrollment and retention and develop effective policies, innovative transfer pathways, and practices impacting student success. Cigularova holds a Bachelor of Science in Banking and Finance from the University of Economics in Bulgaria and Master of Science in Student Affairs in Higher Education from Colorado State University. She has been involved in federally funded grants and has presented her work at national and international conferences.*