



Increasing STEM Belonging and Building Social Capital for Faculty for Student Success

Ella Moats, Marjorie Darrah, and Roxann Humbert



Research Question

How does faculty participation in the First2 Network impact their sense of belonging, social capital, and connection to students?

Why? *Helping faculty succeed in their career through improvement science allows them to better mentor students, strengthening both students and their institution.*



Background – **Sense of Belonging for Faculty**

- Sense of Belonging is a fundamental human need (Maslow, 1954)
- **Much research** showing that increased sense of belonging has positive impacts on **students** in academia
 - Persistence, career interests, academic performance (Shortlidge, et al, 2024; Xu & Lastrapes, 2022; Li & Singh, 2023)
- **Little research** on how sense of belonging impacts **faculty**
 - Increased job satisfaction, perception of success (Paxton, 2021)
 - Retention of faculty (Balgopal, et al, 2022)



Background – Social Capital for Faculty

- Social Capital Theory encompasses ideas of how social networks and relationships are related to shared values, trust, reciprocity, and cooperation (Motkuri, 2018). Creating Social Capital benefits for faculty include:
 - Knowledge sharing and visibility (García-Sánchez, et al, 2019)
 - Academic productivity ((Filipovic, et al, 2023)
 - Positive impacts on mobility (Bauder, 2020)
- Three types of Social Capital relationships: (Claridge, 2024)
 - Bonding: connecting with colleagues within an institution in similar fields
 - Bridging: connecting with colleagues outside an institution in similar fields
 - Linking: connecting with colleagues in different hierarchal positions



Background – Student Connections

- Faculty-Student connection leads to:
 - Deeper and more extensive social networks for faculty
 - Academic success, confidence, and social support for students (Middleton et al., 2015)
- Understanding the impacts of Sense of Belonging and Social Capital on faculty is vital to strengthening their careers and institutions.
- Reciprocal interaction with student will lead to positive outcomes for faculty.



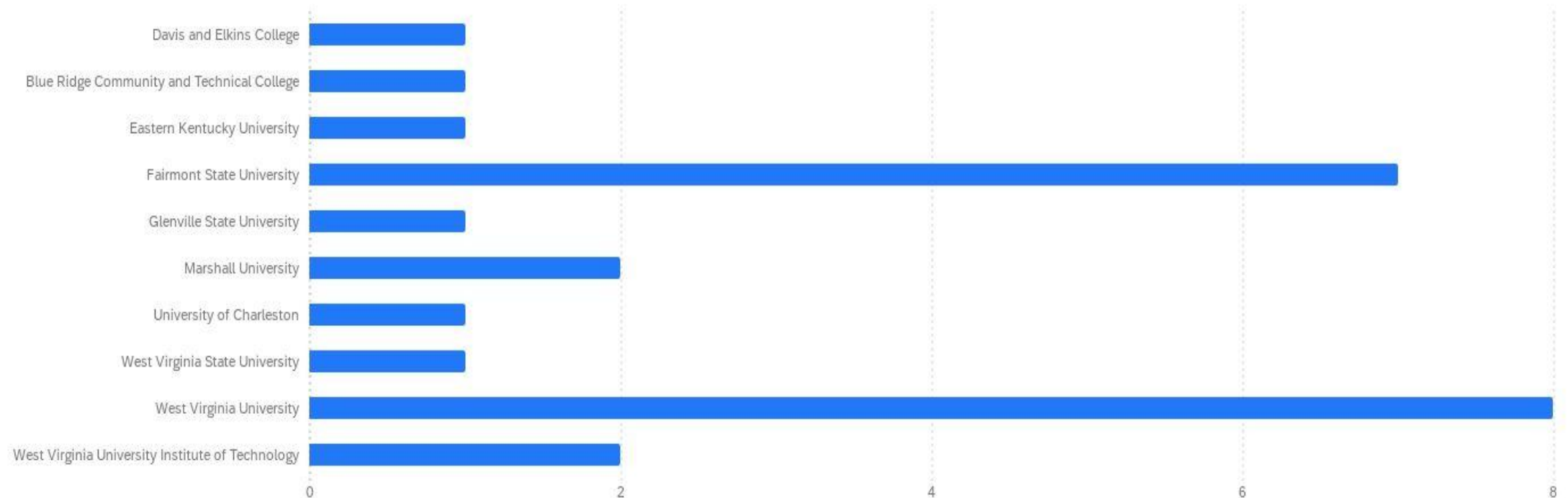
Methods

- Social Capital Survey Questions
 - Retrospective survey questions regarding Bonding, Bridging, and Linking scores before and after joining the First2 Network. (N = 20)
- STEM Belongingness Survey Questions
 - Survey questions regarding sense of community and sense of belonging (N=20)
- Student Connection Survey Questions
 - Survey questions regarding perceptions of student connection after the First2 Network. (N=20)
- Plan-Do-Study-Act (PDSA) Involvement Questionnaire
 - Questionnaire regarding effects of PDSA work on students and themselves. (N = 6)
- Publication Network
 - Identified connections between co-authors in 30 publications. (N = 46)



Participant Organizations

Name of Your Institution 25 ⓘ



Results – Sense of Belonging

What do we notice?

- 80% of respondents felt connection to the F2N
- 75% felt people in F2N are good at influencing each other
- 70% felt they had a bond with others in the F2N
- 60% felt a sense of belonging

Results generally show a positive sense of community and belonging, however there is room for improvement.



Question (N=20)	Mean	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)
I feel connected to the First 2 Network.	4.02	2	0	2	7	9
		10%	0%	10%	35%	45%
I have a good bond with others in the First2 Network.	3.85	2	1	3	6	8
		10%	5%	15%	30%	40%
The First2 Network helps me fulfill my needs (Note: N=19).	3.21	2	3	6	5	3
		11%	16%	32%	26%	16%
I have a say about what goes on in the First2 Network.	3.4	2	3	4	7	4
		10%	15%	20%	35%	20%
People in the First2 Network are good at influencing each other.	3.9	1	1	3	9	6
		5%	5%	15%	45%	30%
I feel a sense of belonging to the First2 Network.	3.65	1	4	3	5	7
		5%	20%	15%	25%	35%
I feel that I am a member of the First2 Network.	4	1	4	0	4	11
		5%	20%	0%	20%	55%
I see myself as part of the First2 Network	4	1	4	0	4	11
		5%	20%	0%	20%	55%

Results – Social Capital

Survey Item	Area	Mean Before	Mean After	Increase	p-value
I feel connections to...					
Colleagues at my institution in my discipline	BO	3.4	3.75	0.35	0.0692
Colleagues at my institution in other STEM disciplines	BO	2.8	3.4	0.6	0.0020*
Colleagues outside my institution in my discipline	BR	2	2.65	0.65	0.0009*
Colleagues outside my institution in other STEM disciplines	BR	1.95	2.75	0.8	0.0007*
Administrators at my institution	LI	2.95	3.25	0.3	0.0298*
Industry Professionals	LI	2.1	2.45	0.35	0.0047*

What do we notice?

In general, faculty felt more connection to others in all categories after joining First2 Network.



Results – Connection to Students

What do we notice?

Involvement with First2 had positive impacts on how faculty connected to their students.

Question (N=20)	Mean	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)
I feel more connected to my students.	3.45	1	2	9	3	5
		5%	10%	45%	15%	25%
I feel more equipped to support students (N=19).	3.68	1	1	7	4	6
		5%	5%	35%	20%	30%
I understand the student perspective better.	4	1	1	4	5	9
		5%	5%	20%	25%	45%
I feel more confident in my ability to relate to students.	3.5	1	2	8	4	5
		5%	10%	40%	20%	25%
I believe my students find me more approachable	3.4	1	2	9	4	4
		5%	10%	45%	20%	20%



Results – PDSA Questionnaire (N=6)

Q1: List PDSAs you are involved in	Q2: List how PDSA work helped students at your institution	Q3: List how PDSA work helped faculty grow professionally
<ul style="list-style-type: none">• The faculty mentioned 18 PDSAs that serves to connect students to each other, faculty, and resources on campus.	<ul style="list-style-type: none">• Provided academic support and skill development• Early college experience and transition• Engagement and relationship building• Career and research opportunities• Personal growth and identity	<ul style="list-style-type: none">• Research and project development• Networking and collaboration• Academic writing and publishing• Presentation and conference participation• Skills enhancement• Career development• Recognition and impact



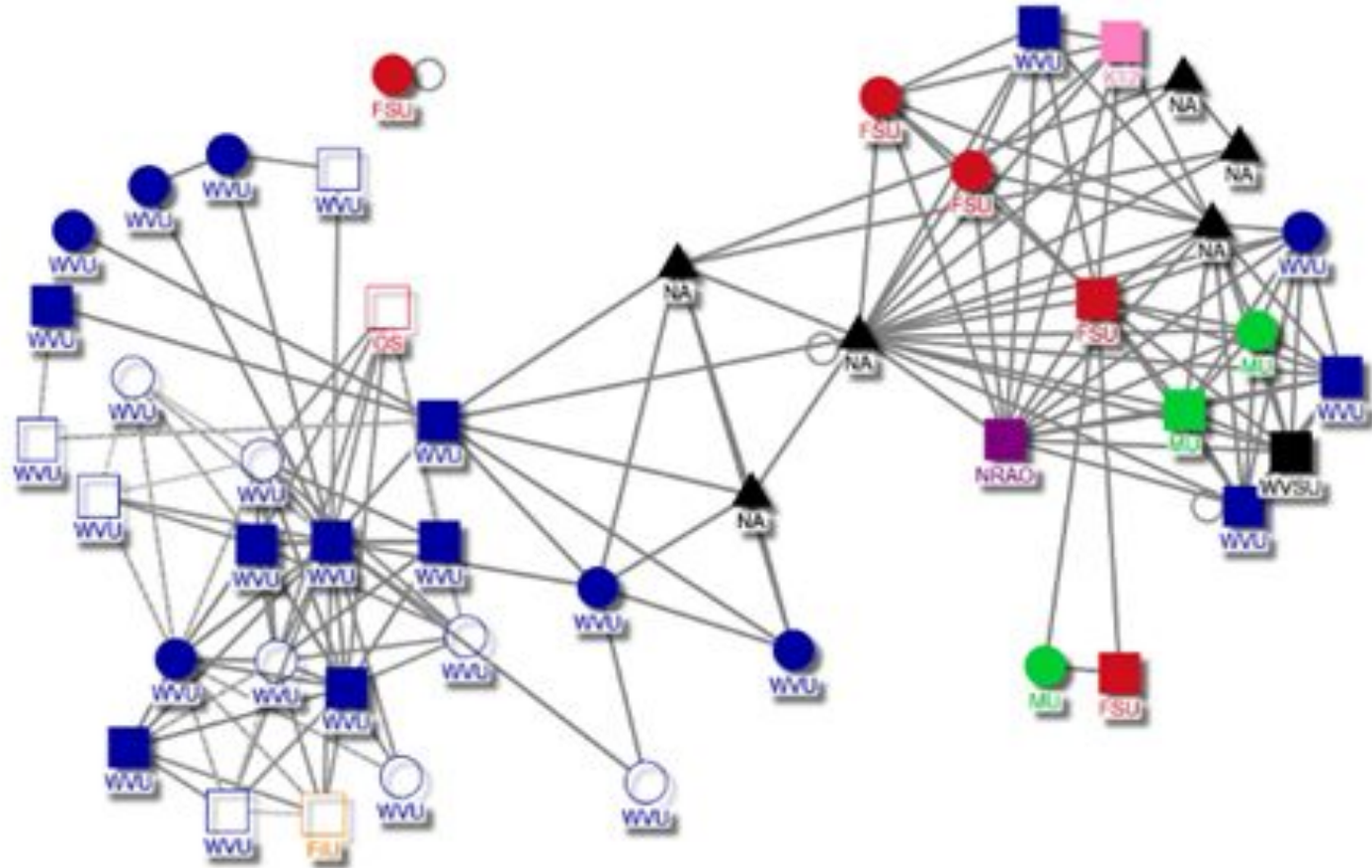
Results – Publication Network

What do we notice?

Publications strengthened ties between faculty, faculty and students, and institutions.

There are bonding, bridging, and linking connections represented, indicating the F2N members are gaining social capital.

Collaboration also fosters a sense of belonging.



Created with NodeXL (<http://nodexl.codeplex.com/>)

Nodes are individuals labeled with their organization. F2N have solid nodes, non-F2N have open nodes. Faculty are squares, students are circles, and triangles are non-academic people. Colors indicate organization. Connections between nodes are co-authorship on publication.



Conclusions

- *F2N faculty members perceive a sense of belonging.*
- *F2N faculty members perceive enhance connections to students.*
- *PDSA work has created an excellent opportunity for faculty professional growth.*
- *F2N publication collaboration has contributed to the development of both bridging and bonding social capital for participants of the First2 Network.*
- *F2N is facilitating connections for faculty with other like-minded professionals that is leading to professional growth.*
- *The F2N is creating successful faculty members who are dedicated to student success.*



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