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Transformative Learning Gains in Undergraduate Learning Assistants

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TRANSFORMATIVE LEARNING GAINS IN UNDERGRADUATE LEARNING ASSISTANTS

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HONORS PROJECT

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ABSTRACT

The Learning Assistant (LA) program is utilized at Bowling Green State University (BGSU) to assist in shifting classrooms from lecture based to more interactive and groupwork based learning. LAs are employed in courses with greater than 80 students enrolled that have historically high drop, withdrawal, and failure rates. Not only are students in courses with LAs having positive experiences, but the LAs themselves are as well. Interest has grown in the development of LAs during their time in the program; this can be measured in the form of transformation. Transformative learning is defined as "learning that results in transformative changes which alter the student in a significant way, changing the state of the learner" (Springfield et al., 2015). Through their time in the program LAs have been studied through the use of survey answers, using a coding rubric developed by Springfield et al., to determine their levels of transformative learning. Involvement in the LA program has been shown to transform LAs in four categories, confidence, skills, perspective, and identity. Data has shown that a large majority of LAs experience high levels of transformative learning gains in all four categories. One way this transformation is extremely beneficial to LAs may be that they have a stronger identity within their STEM field (Close, 2016). Factors influencing this transformation in LAs is investigated, with the impact of different approaches to LA training being a focus.

INTRODUCTION

The Learning Assistant (LA) program at Bowling Green State University (BGSU) began in 2015 and has slowly grown ever since with, on average, 5-8 faculty and 50-80 LA's participating in the LA program each semester. LAs are utilized in high drop, withdrawal, and failure rate courses and chosen based on their own success in that very course, typically students who have earned a grade of B or higher. LA's assist in the classroom by promoting active learning and communication among students during group work in class, as well as providing tutoring opportunities to students outside of class. Institutional data indicates that the BGSU LA program raises retention rates and lowers failure rates of students in courses with LAs.

A training program for LAs began in the Fall of 2016 to better prepare LAs for their work in classrooms. In order to continually improve the LA program as well as budget for time better, training programs were reworked over the years of the LA program. Initially, training was offered during the Fall 2016, Spring and Fall 2017, and Fall 2018 semesters to any LA who had not previously gone through training. There were three different training programs developed during this time. Initially, Fall 2016 and Spring 2017 training consisted of 5 1-1 ½ hour in person sessions lead by an experienced LA and professor experienced with teaching with LAs and who directs the BGSU LA program. This training is referred to as Intensive In-Person training. In the Fall of 2017, online training was piloted using the same information from the previous semesters and incorporating quizzes to test LAs knowledge. This training is referred to as Moderate Online training. In the Fall of 2018, face-to-face training was resumed, but condensed to two sessions. This training is referred to as Moderate In-Person training.

At the end of every semester worked, LAs complete a survey, reflecting on their LA roles and providing feedback on the LA program components, including training. In the Fall of 2016, the survey was modified to prompt LA reflection on their transformative learning experiences. One way the impact of these training programs was measured, was by evaluating the level of

transformation first semester LAs experienced after going through each type of training. However, there are additional factors to consider, that may contribute to transformative learning gains in LAs, some of which are explored. For example, each classroom that LAs are used in has varying levels of active learning, with some at 100% active learning and others at less than 50%, which may change the level of transformation LAs attain. Experience, in the form of number of semesters a student has worked in the LA program, may also contribute to the level of transformation undergone.

Literature Review

Active learning is relatively new compared to the traditional lecture-based classrooms that have been so prevalent in education systems. Active learning has been shown to increase student performance in STEM courses by raising exam scores and lowering failure rates by 55% compared to traditional, lecture-based classrooms (Freeman, 2014). This is not only beneficial to students, but also the educational institutions where they are enrolled. Retention rates are improved at colleges when classrooms employ active learning techniques (Braxton, 2000).

College classrooms have also risen in size as more students have pursued further education, creating an even larger divide between student and professor. Students are more likely to succeed in smaller classrooms where student-student and student-teacher interaction is high (Brewer, 2001). This type of student engagement improves retention of material and post-test scores as well (Prince, 2004).

Lowering the number of students per classroom is not always possible, but a solution that has been shown to help is use of the Learning Assistant program. The LA program was created at the University of Colorado Boulder and was brought to Bowling Green State University in 2015 by Dr. Karen Sirum, due to its success at many higher education institutions since its initial start (Goertzen, 2011). LAs are able to work with students individually, creating the same type of interaction with students that a small classroom might have.

Experiential learning, a recent movement among college campuses across the country, values the links between work, personal development, and education (Kolb, 2015). In the experiential learning model, the workplace is seen as another source of learning that can enhance the education received in a classroom (Kolb, 2015). LAs are a unique example of the experiential learning model because, not only are they working in a professional environment, but that environment is a classroom. They are also working one-on-one with groups of students, allowing for personal development as well. They are developing skills and knowledge while in the LA program, due to this experiential learning.

Research has been done to further develop LAs skills and knowledge in pedagogical principles and instructional strategies to better assist students (Otero, 2018). There are three criteria for the ideal LA program which are group interaction with students, faculty engagement through weekly meetings, and a pedagogy course for new LAs (Otero, 2018). LAs are able to further develop themselves and be better resources for students, a benefit to both. LA's are shown to have stronger identities within the STEM field after participation in the program (Close, 2016). These changes are of interest to researchers.

LAs are actively involved in critical thinking and discussion with students which are key in transformative learning which seeks to develop the learner (Mezirow, 2003). Transformative

learning can be measured using a rubric developed by Springfield et. al. (2015). We used four of the categories, confidence, skills, perspective, and identity, for coding surveys from BGSU's LA program. The rubric from Springfield et. al. was adapted to the LA program at BGSU to measure transformative learning (Neel, 2018). LA responses to the surveys document the presence of key words and phrases pertinent to the category and level of transformation occurring in LAs. The adapted rubric by Leah Neel has been used to code the most recent LA surveys for transformation.

METHODS

From Fall 2016 through Fall 2018, a total of five semesters of data collection, a survey was given to every LA each semester and that survey was coded for transformative learning gains in four categories, confidence, skills, perspective, and identity. The LA program Evaluator obtained IRB approval, and used Qualtrix to host the survey and a link to the survey was sent out via email by the LA program Leader to LA faculty members to share with their LAs in the program. LAs were informed that all responses to the surveys would remain confidential. The survey responses were downloaded from Qualtrix and the LA program Leader provided me with all the responses, after removing respondents' identifying information. Response rates varied each semester. Fall 2016 had 75 LAs employed, and 54 LAs responded to the survey, with a completion rate of 72%. Spring 2017 had 80 LAs employed, and 46 responded to the survey, with a completion rate of 58%. Fall 2017 had 83 LAs employed, and 51 LAs responded to the survey, with a completion rate of 61%. Spring 2018 had 76 LAs employed, and 47 LAs responded to the survey, with a completion rate of 62%. Fall 2018 had 72 LAs employed, and 41 LAs responded to the survey, with a completion rate of 57%.

The original transformative learning rubric, seen in Table 1, was developed by Springfield and Gwozdek (Springfield et. al., 2015). It was adapted and used first by Katelyn Jakyma (2017) and then by Neel (2018) to code the Fall 2016 and Spring and Fall 2017 surveys. Similarly, I used the adapted rubric seen in Table 2, to code the remaining surveys from Spring and Fall 2018.

Responses to the surveys were coded based on if it showed evidence of transformative learning in one of the four categories, confidence, skills, perspective, and identity. Answers could be coded as partially or fully transformed. If a respondent had multiple partially transformed answers in one category it was counted as one in that category. If a respondent had partially and fully transformed answers in one category it was counted as fully transformed in that category. Answers that showed transformation in confidence were colored red, skills were colored blue, perspective were colored green, and identity were colored purple. Answers that showed no transformation in any category remained in black text. If an answer was considered partially transformed, then the text would be colored to the appropriate categories. If an answer was considered fully transformed, then the background of the text would be colored to the appropriate categories.

Type-of-Change Codes		
Code and Description	**Details**	**Keywords & Examples**
Confidence: Students' perception of their comfort or perceived ability to do a thing	This is NOT better skill, but rather greater *belief* in one's ability to use a skill. Often double-coded with skill or identity. For example, "I am much more confident about my writing skills" would be double-coded for both Confidence and Skill.	Confident, comfortable, easy, no longer a problem "I used to be terrified of public speaking, but now it doesn't bother me." "I'm much more comfortable networking now."
Pride: Expressing gratification in an accomplishment	Similar to confidence, but usually very explicit about being proud of a skill.	"I found it rewarding to…" "I was so proud that I…" Do not code generic statements such as "I'm so proud of all of us"
Skills: anything the student has learned to DO as part of the program.	Teamwork, relationships, "soft" skills Clinical skills Communication/presentation skills Teaching skills Leadership skills (I have improved my leadership skills, like listening, communicating, etc.)	"I can now…", "I have improved…", "I [verb] better…" "I have become more [adjective]…"
Perspective: changes in how the student understands or sees *other* people	Externally focused I understand SOMETHING ELSE (outside of myself) differently than I did before How I perceive other people is different How I think/believe the world works is different I have a different understanding of my profession now	"I see leadership in a different way; I used to think leadership was X, now I think it's Y." "I never realized how hard it is to sign up for Medicaid." "I used to think the best way to change someone's mind was to give them more data. Now I know it's more complicated."
Identity: Changes in how students understand or see themselves.	Internally focused Vision of self, career, path Traits about myself: I AM a different person or kind of person Change in motivation or direction (I'm now motivated to…) Confirmation of motivation or direction (non-transformative change only)	"I *am* now…" "I have become a better [noun]…" "I see myself as a Leader; my vision of *myself* as a leader has changed" "I confirmed that I still want to…" (always non-transformative) Role, see myself

Table 1. Rubric to measure transformation created by Springfield and Gwozdek.

Trait	Transformed	Partially- Transformed
Confidence	Gives details about their feelings and nerves at the start of their position and how that has changed. • "I use to be very shy/quiet/reserved …now I feel more comfortable/confident" • "At the beginning I was nervous about… now I am less nervous/more comfortable/more confident"	States a change but gives no details of their confidence prior to their position as an LA • "more comfortable/ confident" • "less nervous" • "It is easier"
Skills	Gives an indication of their skills before the start of their position and how they have learned or improved skills. • "At first I didn't know how to ____ but I've learned" • "I used to do this, now I do this"	States that they gained a skill but doesn't talk about their skills prior. • "I have improved" • "I learned how to…" • "I know how to ___ better" • "I now do ___ (ask more questions with questions)"
Perspective	States their opinion or view of something before being an LA and how it has changed. • "I used to think___, now I think___" • "I now see that teaching is more than just ___, it is ___"	States a change in their views but doesn't give details of their views before. • "I now realize" • "I see teaching differently" • "My understanding has changed" • "I have learned the importance of"
Identity	States how they viewed themselves at the beginning and how that has changed. • "I didn't think I would be a good teacher, now I realize I am better than I thought" • "Before I started I thought of myself as ___ but now I see myself as ____"	States a change in self but doesn't say how they were before or what they thought or how they were before. • "I do/view ____ differently" • "I am a better _____" • "I realized that I can ____ better than I thought" • "I act more ____ towards others"

Table 2. Adapted rubric for LA population at BGSU created by Jakyma and Neel to measure transformation of LA's based on the original rubric created by Springfield and Gwozdek.

The initial survey given in the Fall of 2016 was comprised of multiple-choice questions and very few open answer questions. Depending on the choice chosen or answer written, each response was either coded as no transformation, partial transformation, or full transformation (Jakyma, 2017). The Fall 2016 survey was not an ideal prompt to illicit LA discussion of the aspects of their transformation, so for the following semester it was changed to an open-ended prompt based on that used by Springfield and Gwozdek, to gather more information about the LA transformation.

The adapted LA Transformation rubric made it simpler to code survey answers as partial or full transformation specifically for LAs at BGSU. Each category, with slight variation, was considered fully transformed if the answer had statements about previous and current feelings or abilities. Partial transformation was determined by key words and phrases and if only current feelings or abilities were stated, but not previous feelings or abilities. Transformation in confidence in respondents was determined by the use of words such as confident, comfortable, and easy and with phrases such as "more comfortable/confident," "less nervous," and "it is easier" (Neel, 2018). An example of a respondent with full transformation in confidence from the Fall 2018 survey is:

"In the beginning of the semester, I was really nervous to be in charge of two different groups in which they both had six people in them. Throughout the semester, things began to get easier as I was getting closer with my groups because I was getting more comfortable with them all."

This answer provides feelings prior to the LA position, feelings after experience in the LA position, key word "easier," and key phrase "more comfortable" all of which show full transformation in the category of confidence. If this answer did not include the respondent's feelings at the beginning of the semester and only their current feelings it would have been coded as partially transformed in confidence.

Transformation in the skills category is determined by key phrases such as "I've improved on," "I've learned how to," and "I now do" (Neel, 2018). Some skills could be improved ability to lead students to answers through the use of questions, stronger grasp on course material, or better public speaking ability for example. An example of a respondent with full transformation in skills from the Spring 2017 survey is:

"I feel like it was a lot harder than I thought it would be to teach students with no [subject] background when I am a [subject] major. I found myself sometimes talking beyond the students' knowledge because I just have so much knowledge to give and I confused them sometimes. It became easier to teach as the semester went on and I got a hang for how much each student knew."

This response shows how the LA felt coming into the position, how they learned what their students needed, and was able to develop skills to better assist them. This shows full transformation in skills because of the indication of skills prior to and after involvement in the LA program. If the answer only provided current skills and not the progression of skills it would be marked as partial transformation in skills.

Transformation in the category of perspective required respondents to use key phrases like "I used to think ___, now I think ___," "I now realize," and "my understanding has changed" (Neel, 2018). Perspective is about changing the mindset on a subject related to the LA experience, usually about teaching. An example of a respondent with full transformation in perspective from the Spring 2018 survey is:

"Originally, I thought that one gets out of a class what they put into it, and to a certain degree I still believe this. However, I do think that sometimes you need to push students a bit, and but a little faith in them in order for them to succeed. Sometimes students need to see that someone is invested in them, in order for them to strive for success. This class really has taught me that. I have seen some students in my group who showed some reservations about wanting to

participate, but with a little involvment from myself, have grown as individuals. They have but forth initiative into the class, and have made relationships with other members of our group. In my eyes, this is a very important part of the learning process, making connections with others who encourage you to better yourself. If I have gained nothing else from this experience, I think this is the most important bit of knowledge I have gained."

This LA's answer states their view prior to involvement in the LA program, their new viewpoint, and how they came to that new viewpoint. This answer is very thorough and gives insight into this respondent's change throughout the semester. If the answer had only contained their current new view and not their previous view, then it would be considered partial transformation in perspective.

Identity transformation is seen when the key phrases "I do/view ___ differently," "before I started I thought of myself as___, but now I see myself as," and "I realized I can ___ better than I thought" (Neel, 2018). Changes in identity constitute changes to the LA's views of themselves and the things they do in their personal lives. An example of a respondent with full transformation in identity from the Spring 2017 survey is:

"I definitely think I have a different style of teaching now after explaining concepts to non-[subject] majors and first year students. It has helped me grow as a person, but I realized that not everyone has the same level of knowledge that I have and some do not care/are not as passionate about the topic as me and just want the basics. I feel like I am now able to know specific details and just give key ideas or explain in great detail for those who want it/ need it."

This response is an example of full transformation in identity because of the evidence of a change in the LA's actions due to the influence of the LA program experiences. This LA states their views prior to and after their time in the LA program and how that changed them.

Coding was done by two different coders, Neel and me, but the same coding methods were used. When previously coded surveys (Neel, 2018) were reviewed and recoded by myself, I coded the survey answers the same as Neel, indicating good inter-rater reliability.

RESULTS

As described in the methods, the Spring 2017 survey was a revised version of the Fall 2016 survey, to be in alignment with the transformative leaning prompts used by Springfield and Gwozdek (2015). Since the 2016 survey was entirely different from the surveys following it, it is not surprising that a difference in the way it was coded occurred compared to subsequent surveys. It was also challenging to apply the transformation rubric to the initial survey because it was not designed to illicit responses that may show transformation. The data from the initial survey in the Fall of 2016 was found to be an unreliable representation of the transformation occurring in LAs, exaggerating the degree of transformation occurring due to ambiguity in the LA responses. In Figure 1 and Table 3, the Fall 2016 training data can be seen; it shows a much higher rate of transformation compared to other semesters, even though it was the same training methods as those in Spring 2017. In further data tabulation and analyses, the Fall 2016 data was removed from the rest of the data sets to prevent skewed results.
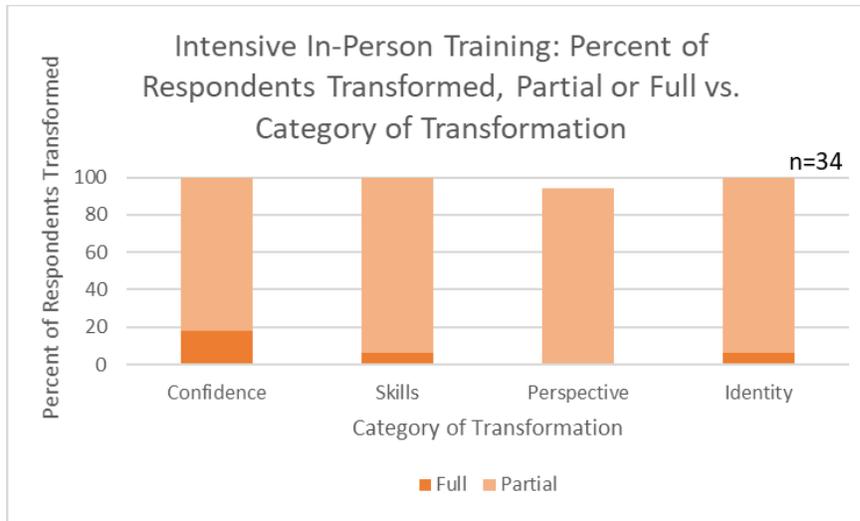
Figure 1. Percent of Fall 2016 LA survey respondents indicating partial and full transformation in each of the transformation categories.

Intensive In-Person Training

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	28	82	6	18
Skills	32	94	2	6
Perspective	32	94	0	0
Identity	32	94	2	6

Table 3. Number of Fall 2016 LA survey respondents indicating partial and full transformation in each of the transformation categories.

Training initially started so that LAs could be better prepared to assist in classrooms. The first two semesters that training was offered to LAs, it was the Intensive In-Person training which allowed significant time for interactions between LAs and the LA training instructor. It was thorough in the information it provided, based on the LA Alliance national model for LA Programs (Learning Assistant Alliance) and was able to explain many important concepts to the LAs, such as the importance of answering questions with questions which allows students to be led to the answer, not simply given the answer. This took a considerable amount of time for both the LAs, who are usually very involved students with busy schedules, and the training instructor. Due to time constraints, and to alleviate the pressure on both the LAs and instructors, the Moderate Online training was used for the next semester. This training contained the same information as the previous training, but involved far less interaction among LAs and instructors, causing concern about how effective it was in preparing LAs to work face-to-face with students. The next semester that training was offered was the Moderate In-Person which was only two sessions. A pared down version of the information previously given in trainings was used. It brought back the face-to-face interactions while also lowering the amount of time dedicated to the training, a benefit to both LAs and the training instructor. The Moderate In-Person training has continued to be used since then. Only LAs who were in their first semester in the position and went through training were included in the training data sets, helping to limit some confounding variables such as experience. The data from each training type can be seen in Figure 2 and Table 4.
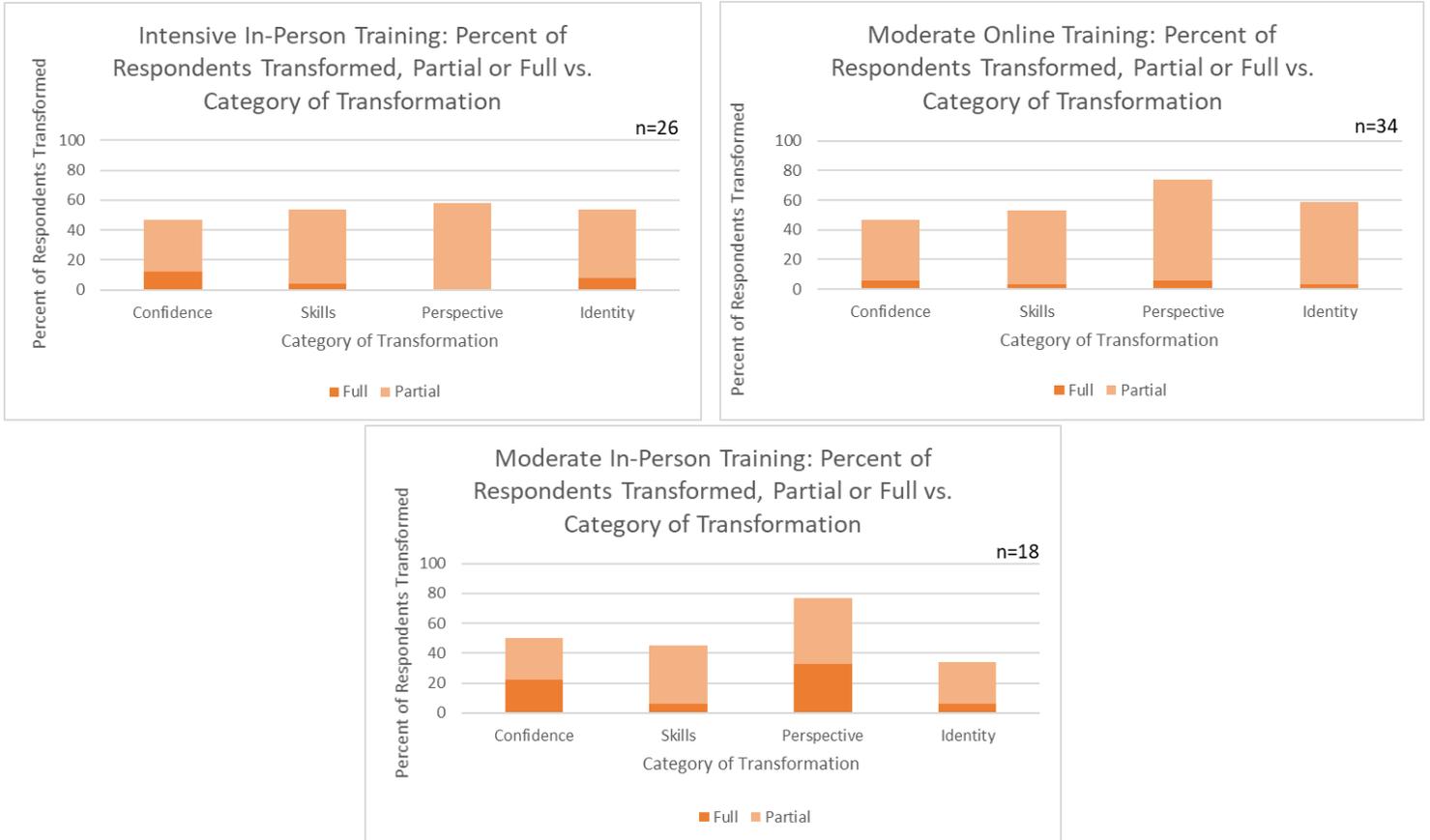
Figure 2. Percent of LA survey respondents indicating partial and full transformation in each of the transformation categories for three different type of training offered.

Intensive In-Person Training

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	9	35	3	12
Skills	13	50	1	4
Perspective	15	58	0	0
Identity	12	46	2	8

Moderate Online Training

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	14	41	2	6
Skills	17	50	1	3
Perspective	23	68	2	6
Identity	19	56	1	3

Moderate In-Person Training

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	5	28	4	22
Skills	7	39	1	6
Perspective	8	44	6	33
Identity	5	28	1	6

Table 4. Number of LA survey respondents indicating partial and full transformation in each of the transformation categories from the three training types.

The number of semesters each LA has worked and their total transformation from all semesters worked were totaled and the percentage of each transformation category was calculated. Figure 3 shows the percentage of transformation, partial and full combined, for each transformation category for LA's who worked from 1-5 semesters. There were 56 survey respondents who were first semester LAs, 29 second semester LAs, 22 third semester LAs, 7 fourth semester LAs, and 9 fifth semester LAs. The LAs who worked for longer in the LA program showed more transformation than those who worked for fewer semesters. This may be due to the increased classroom time that more experienced LAs had. This can influence confidence because veteran LAs will have a stronger grasp of the material, they will have had longer to gain skills, longer to gain a greater appreciation of teaching and change their perspective, and more time to integrate what they have learned into their own lives affecting identity. Figure 3 shows the gradual rise in transformation, but the majority of transformation occurs in the first semester as an LA. A more detailed look at the data, separating the partial and full transformation, is provided in Figure 4 and Table 5.
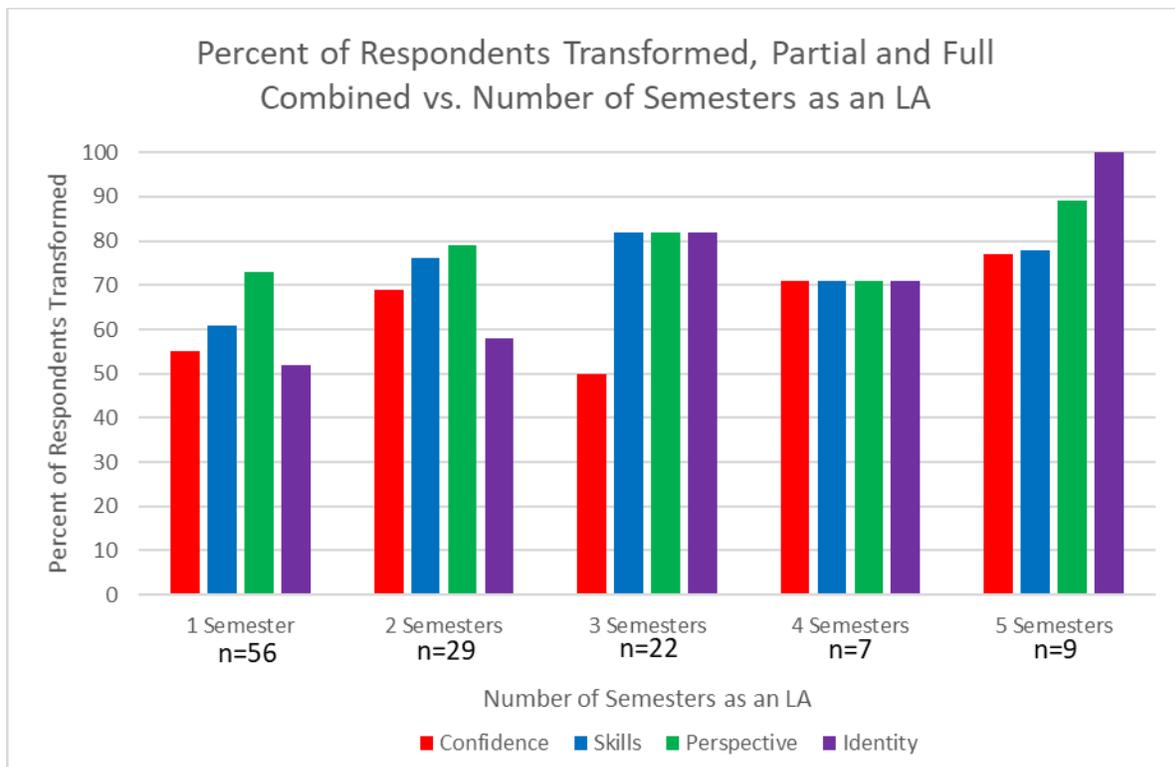

Figure 3. Percent of LA survey respondents indicating total transformation in each of the transformation categories, separated by the number of semesters a student has worked as an LA.

Percent of First Semester LAs Transformed, Partial and Full vs. Category of Transformation

n=56

Percent of Second Semester LAs Transformed, Partial and Full vs. Category of Transformation

n=29

Percent of Third Semester LAs Transformed, Partial and Full vs. Category of Transformation

n=22

Percent of Fourth Semester LAs Transformed, Partial and Full vs. Category of Transformation

n=7

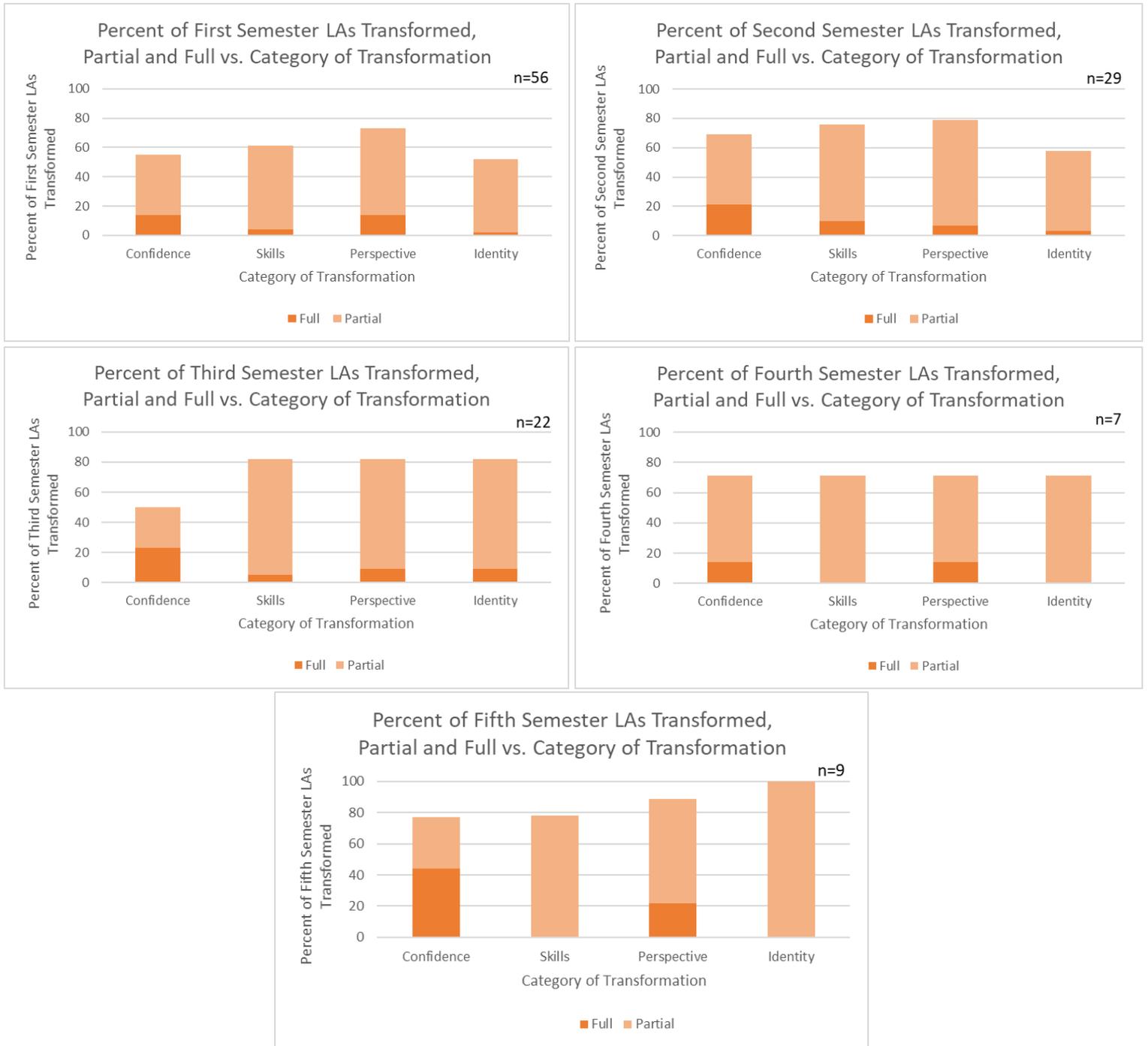Percent of Fifth Semester LAs Transformed, Partial and Full vs. Category of Transformation

n=9

Figure 4. Percent of LA survey respondents indicating partial and full transformation in each of the transformation categories, separated by the number of semesters a student has worked as an LA.

1 Semester as an LA

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	23	41	8	14
Skills	32	57	2	4
Perspective	33	59	8	14
Identity	28	50	1	2

2 Semesters as an LA

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	14	48	6	21
Skills	19	66	3	10
Perspective	21	72	2	7
Identity	16	55	1	3

3 Semesters as an LA

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	6	27	5	23
Skills	17	77	1	5
Perspective	16	73	2	9
Identity	16	73	2	9

4 Semesters as an LA

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	4	57	1	14
Skills	5	71	0	0
Perspective	4	57	1	14
Identity	5	71	0	0

5 Semesters as an LA

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	3	33	4	44
Skills	7	78	0	0
Perspective	6	67	2	22
Identity	9	100	0	0

Table 5. Number of LA survey respondents indicating partial and full transformation in each of the transformation categories, separated by the number of semesters a student has worked as an LA.

Classroom observations were conducted by others in the LA program Leader's research group, to document the degree of interactive engagement teaching strategies used in the LA classrooms. These were grouped into 3 categories, and color-coded green, yellow, or orange, based on the level of interactive learning occurring. Green is the color of classrooms labeled Extensive Group Work. Classrooms are considered to be Extensive Group Work when more than 50% of class time is group work or lecture time is no more than 50% of class time. There are three Extensive Group Work classrooms with 45 LAs. Yellow is the color of classrooms labeled Emergent Group Work. Classrooms are considered to be Emergent Group Work when lecturing is 55-76% of class time and group work is less than 50% of class time. There are six Emergent Group Work classrooms with 39 LAs. Orange is the color of classrooms labeled Socratic Lecture. Classrooms are considered to be Socratic Lecture when lecture is equal to or greater than 80% of class time and students are answering questions less than 20% of class time. There are two Socratic Lecture classrooms with 32 LAs. Figure 5 depicts the percent of LA survey respondents indicating transformation in each of the transformation categories, sorted by each of the classroom types an LA worked in. Figure 6 depicts the percent of LA survey respondents indicating partial and full transformation in each of the transformation categories, sorted by each of the classroom types an LA worked in, and Table 6 depicts the number of LAs partially or fully transformed for each category in each of the classroom types. The data indicate that there is more full transformation in LAs who worked in the Extensive Group Work classrooms, but all three show fairly high levels of partial transformation. Extensive Group Work classrooms have less lecture time, so it is possible that LAs are being utilized for more groupwork which allows them to interact more with students, possibly increasing their levels of full transformation.
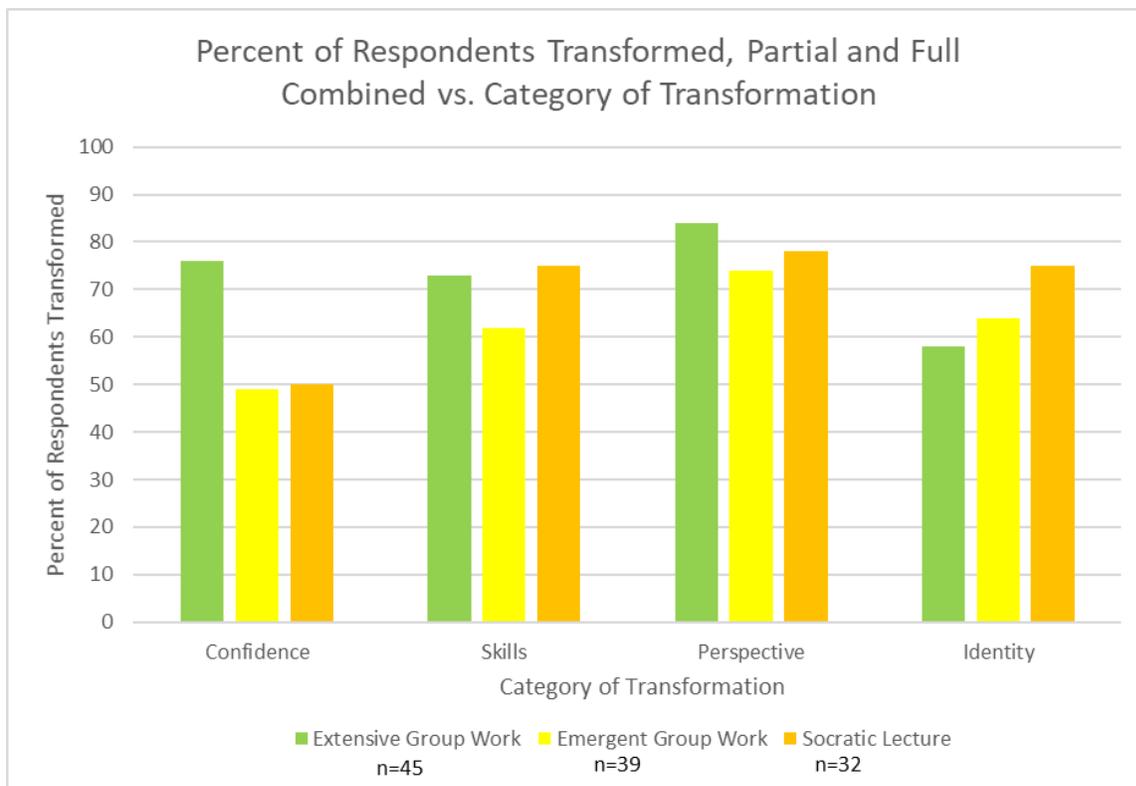

Figure 5. Percent of total transformation of LA survey respondents by classroom type, transformation categories color coded in legend.
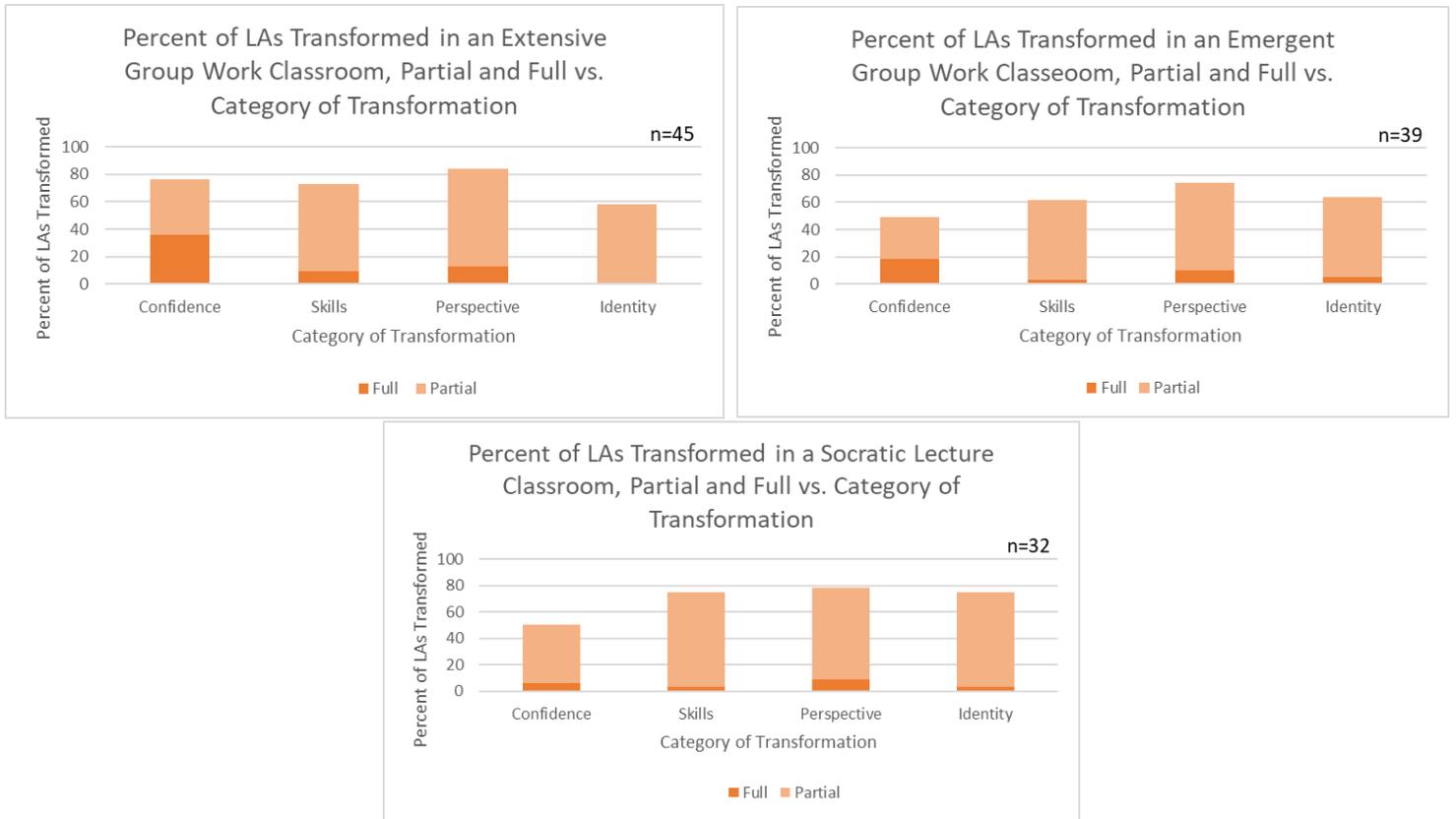
Figure 6. Percent of partial and full transformation of LA survey respondents in each of the three classroom types.

Extensive Group Work Classroom

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	18	40	16	36
Skills	29	64	4	9
Perspective	32	71	6	13
Identity	26	58	0	0

Emergent Group Work Classroom

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	12	31	7	18
Skills	23	59	1	3
Perspective	25	64	4	10
Identity	23	59	2	5

Socratic Lecture Classroom

Category of Transformation	Number of Respondents Partially Transformed	Percent of Respondents Partially Transformed	Number of Respondents Fully Transformed	Percent of Respondents Fully Transformed
Confidence	14	44	2	6
Skills	23	72	1	3
Perspective	22	69	3	9
Identity	23	72	1	3

Table 6. Number of LA survey respondents indicating partial and full transformation in each classroom type.

The Spearman Correlation Analysis, seen in Table 7, was done to see the levels of significance between variables. Each category of transformation was run against the number of semesters an LA was in the LA program, the classroom type the LA worked in, and the training the LA experienced. The results show that the number of semesters had a weak correlation to transformation in the category of identity and the classroom type had a weak correlation to transformation in the category of confidence. The lack of additional correlations and the relative weakness of the two observed correlations could be due to very low sample sizes.

Spearman Correlation Analysis

	Confidence	Skills	Perspective	Identity
# of Semesters	0.105719448	0.144666283	0.087547567	0.293908443
Classroom Type	0.250557033	-0.022792184	0.075014738	-0.138182656
Training Type	0.173887824	0.025834925	0.057367972	0.124124675

Table 7. Spearman Correlation Analysis data comparing the various categories of transformation and semesters worked, classroom type, and training type.

CONCLUSIONS

It is conclusive that working as an LA is a transformative experience. Transformation can be seen in every LA who responded to the surveys. Transformation is unknown in those who did not respond to the surveys, which could possibly include LAs who are not transformed in any category. LAs were urged to complete the surveys as part of their LA duties, but there were still some LAs who never responded to any survey given.

The trends in data suggest that the longer an LA was in the program, the more transformation they underwent. Transformation could possibly be attributed to other factors though, such as age, gender, GPA, and major. The LAs could also be showing higher levels of transformation because of the number of years they have been in college which could also increase the possibility of outside factors such as training for other programs, various professional experiences, and more upper level courses being taken, which could contribute to their knowledge in the course material further helping to transform them. LAs that have been in the program longer have also had more survey answers coded, giving them more opportunity to show transformation, whereas new LAs have only had one survey to show their transformation. There were also LAs who responded to surveys some semesters, but not other semesters. Transformation could have occurred in the semesters when they did not respond to the survey.

The trends in the data suggest that LAs who are employed in Extensive Group Work classrooms are more likely to have higher levels of transformation. In every classroom there is usually a mixture of new LAs and experienced LAs. Classrooms with more experienced LAs may show higher levels of transformation, which could contribute to the differences in the levels of transformation seen in the different classroom types. The Extensive Group Work classrooms could possibly have LAs who are more experienced, skewing the data.

There may be an impact on transformation depending on the type of training an LA went through. The Moderate In-Person training data trends showed higher levels of full transformation than any other training type. The type of classroom the LAs worked in could contribute to their levels of transformation regardless of training type though, with trends suggesting that there is

more transformation seen in some than others. The LAs willingness to attend training may also contribute to the levels of transformation seen, assuming those more willing would pay closer attention to material than those who were less willing. The sample sizes for the training data were also smaller than other data sets, which could make them unreliable indicators of the effect of training on transformation overall.

The Spearman Correlation Analysis showed very weak to weak correlations between variables. This could be due to low sample sizes throughout the data sets because of the small size of the LA program. There may also be additional variables that have a stronger correlation, but have not been researched that have a greater effect on transformation.

Application of Findings

It is conclusive that transformation is occurring in LAs, but as of yet the main source of that transformation is unknown.

The trends in training showed that the Moderate In-Person training had the highest levels of full transformation occur. This training can be further developed and utilized in future semesters to continue successfully training LAs for their work in the classroom. Furthermore, finding a way to ensure that all LAs attend training may result in higher levels of transformation overall, benefitting both the students and LAs.

Further modifying the survey given out to LAs each semester to ask more data such as major, age, gender, and GPA may help to consider some confounding variables. Questions regarding previous experiences in similar work environments may also help to delve deeper into outside knowledge that contributes to transformation.

The trends in the classroom type data show that Extensive Group Work classrooms have higher rates of transformation in LAs. Emergent Group Work classrooms are on the verge of moving towards Extensive Group Work style classrooms, making this push could result in higher rates of transformation as well.

Ultimately, growth in the LA program would raise sample sizes, which would allow for more data analysis and possibly more correlation seen between variables.

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