INDIGO
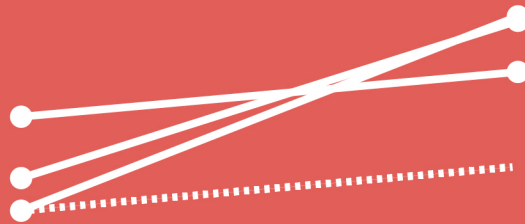## BLUE VALLEY CENTER FOR ADVANCED PROFESSIONAL STUDIES

by Erin Huebert

LEANLAB EDUCATION

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BLUE VALLEY CENTER FOR ADVANCED PROFESSIONAL STUDIES & INDIGO

2020 Research Report

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SCHOOL SUMMARY AND PROBLEM OF PRACTICE

Blue Valley Center for Advanced Professional Studies (CAPS) is located in Overland Park, Kansas, a southern suburb of Kansas City. CAPS serves as a supplementary program to existing high schools in the Blue Valley School District. Students are "fully immersed in a professional culture, solving real world problems, using industry standard tools and are mentored by actual employers, all while receiving high school and college credit." Any student from the Blue Valley School District is eligible to attend. Students spend either the morning or the afternoon session at CAPS and spend the other part of the day at their normal high schools. Students can choose from one of six strands, including engineering, bioscience, and medicine.

The problem of practice identified by teachers, students, and community stakeholders centers on the competitive, high-expectations environment at CAPS. Teachers need resources to identify, address and deal with the social and emotional needs of students who feel immense pressure to do well and pursue "lofty" careers. Yet students are feeling anxiety about what direction to take their careers and are feeling uncertain about how to get there. Dr. Tammy Fry led the pilot initiative and chose to work with Indigo.

VENTURE SUMMARY AND INTENDED EFFECT

The Indigo Education Company—founded by Sheri Smith and Sueann Casey—is a set of tools that empowers students and educators "through self-awareness, empathy, and freedom." Indigo supports *student* success, retention, social emotional health, and career readiness. Indigo also supports the *educators* working with these students to build student responsive cultures and maximize their strengths for the benefit of all. The primary tool used to meet these goals is the Indigo Assessment, which is a comprehensive tool to help students and educators gain insights of their behaviors, motivators, social emotional (SEL) perceptions, and career-ready skills. The sophisticated data platform delivers real-time actionable insights about character development to students, parents, teachers, counselors, and administrators.

The Indigo Assessment can be used on its own or in conjunction with two other sets of resources: 1) online learning modules for students and/or 2) supplemental resources for teachers to help them further instruct and engage with students on how to understand and build off of the insights from the Indigo Assessment.

RESEARCH GOALS

As described above, the Indigo Assessment can be taken alone or in conjunction with 1) online learning modules and/or 2) supplemental teacher resources. The Indigo team was interested to learn what combination of resources yielded the greatest impact on student career clarity and on student social/emotional health.

Accordingly, **the first hypothesis was that students that used the Indigo online modules AND had teacher instruction would yield a larger increase in career clarity than students that only used the Indigo online modules. It was also expected that students that did not use Indigo at all would not increase their reported career clarity.**

The second hypothesis was that students that used the Indigo online modules AND had teacher instruction would yield a larger increase in reported social-emotional health than students that only used the Indigo online modules. It was also expected that students that did not use Indigo at all would not increase their reported social-emotional health.

The third goal of this study was to gather feedback from the teachers and students on usability and implementation of Indigo in order to modify and/or enhance the online learning modules and/or supplemental teacher resources to meet the needs of the unique school context.

METHODOLOGY

Sample

The sample for this study consisted of **459 students,** which represent 80% of the entire CAPS study body for Fall 2019. All students and teachers were eligible to participate, but some teachers opted not to participate in the study, so the students in those classrooms were, as a consequence, not able to participate either. The participating classrooms were randomly divided into three different groups. Group A was the control group and was composed of 179 students that had no exposure to Indigo at all. Group B was the first treatment group and consisted of 85 students that took the online learning modules in conjunction with the Indigo Assessment but did not have further instruction from teachers. Group C was the second treatment group and consisted of 195 students that took the online learning modules in conjunction with the Indigo Assessment AND had further instruction from teachers.

The three groups were not entirely equal in terms of sample size. At Blue Valley CAPS, in a given semester, a teacher will have one group of students in the morning and one group of students in the afternoon. Students do not, therefore, have more than one teacher in a given semester. Accordingly, some teachers selected to be in Group B simply had fewer students in their sections. It was also the case that a couple of teachers self-selected out of Group B into Group A or Group C, thereby skewing larger samples in Groups A and C. Still the distribution of grade, gender, and race were equally represented in each group. There were 10 teachers distributed between Groups B and C, meaning that 10 teachers were ultimately piloting Indigo to 280 students.

Of the overall sample, 74% of the students were white, 10% were Asian, 7% were of two or more races, 3% were Latino, and 2% were black. Since this study had a proper control group and other confounding variables were controlled for, this study was able to evaluate the *effect* of Indigo on student career clarity and social/emotional health.

Measurement of Outcomes

The first outcome evaluated in this study is **student career clarity**. To assess students' career clarity, students were asked to respond to a series of questions on pre- and post-surveys. Table 1 displays the three questions used to measure career clarity and students were asked to respond on a scale of 1-10, with higher values corresponding to more career clarity. A pre-survey was given the week before students began using Indigo at the end of September and the week after the Indigo series ended in mid-December. All students in Groups A, B, and C took the exact same survey via Google Forms during their class at CAPS.

The second outcome evaluated in this study was *social-emotional health*. Among all the possible areas of social-emotional health, the area of interest to Indigo and CAPS was students' level of stress and pressure, particularly related to school and their future plans. Thus, students were asked a series of questions on the same surveys as described above related to their level and source of stress. Table 1 displays the five sets of questions used to measure stress and students were asked to respond on a scale of 1-10, with higher values corresponding to more stress and/or pressure.

Table 1: Survey Questions used to Assess *Career Clarity and Social/Emotional Health*

Career Clarity	On a scale of 1-10, how clear are you about your plans after high school?
	In the last week, how often have you felt confident about your plan after high school?
	On a scale of 1-10, how well do you feel CAPS is preparing you for life after high school?
Social Emotional Health	What stresses you the most in school (select all that apply)? ● Too many tests, Too much homework, Managing my time, Social life/time, Too many rules, Being compared to others, Bullying/mean peers, Getting good grades, Applying for college
	In the last week, how often have you felt pressure or stress to know what your plan after high school is?
	If you have felt pressure or stress to know what your plan after high school is, where is this pressure coming from (select all that apply)? ● Parents, Teachers, Peers, Society, or Self
	In the last week, how often have you felt nervous and "stressed"?
	In the last week, how often have you felt: ● that you were unable to control the important things in your life? ● confident about your ability to handle your personal problems? ● that things were going your way? ● difficulties were piling up so high that you could not overcome them?

RESULTS

In this section, the quantitative results assessing the impact of Indigo on career clarity and social-emotional health are presented. The results compare pre- to post-changes in survey responses between Groups A (control group), B (first treatment group), and C (second treatment group). Paired t-tests were used to compare the average change from pre- to post-survey responses within groups (to determine a meaningful increase among the treatment group) and between groups (determine whether the change in the treatment group is meaningfully different from the change of the control group). Difference-in-difference estimation was used to evaluate the *effect* of Indigo on the average change in survey responses between the control group and treatment groups.

The results are based on the sample of 459 students: 179 students in Group A (control group), 85 students in Group B (treatment group with online modules), and 195 students in Group C (treatment groups with online modules and teacher instruction).

CAREER CLARITY

Overall, there is preliminary support for the first hypothesis that students who used Indigo and had teacher instruction (Group C) will experience the largest increase in career clarity and that students that do not use Indigo will not experience an increase in career clarity.

Figure 1 illustrates the average change in career clarity for all three groups as measured by the change in responses from the pre- to the post-survey on the question of "how clear are you about your plans after high school?"[1] **As expected, Group C experienced, on average, a statistically significant increase in their reported levels of career clarity.** The pre-survey average for Group C was a 7.2 and the post-survey average was a 7.73, representing a 7% increase. **Contrary to expectations, however, Group B did not experience a statistically significant increase in career clarity.** (While the change in Group B looks similar to the change reported in Group C, the variation of responses in Group B is substantial, which explains why the average change failed to reach statistical significance. In Group C, there is less variation, as the vast majority of respondents report increases, so their average increase is, therefore, statistically significant.) **Finally, as expected, Group A did not, on average, experience a statistically significant increase in career clarity.**

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[1] There were no statistically significant changes among the other survey questions related to career clarity.

Figure 1: Average Level of Student-Reported Career Clarity
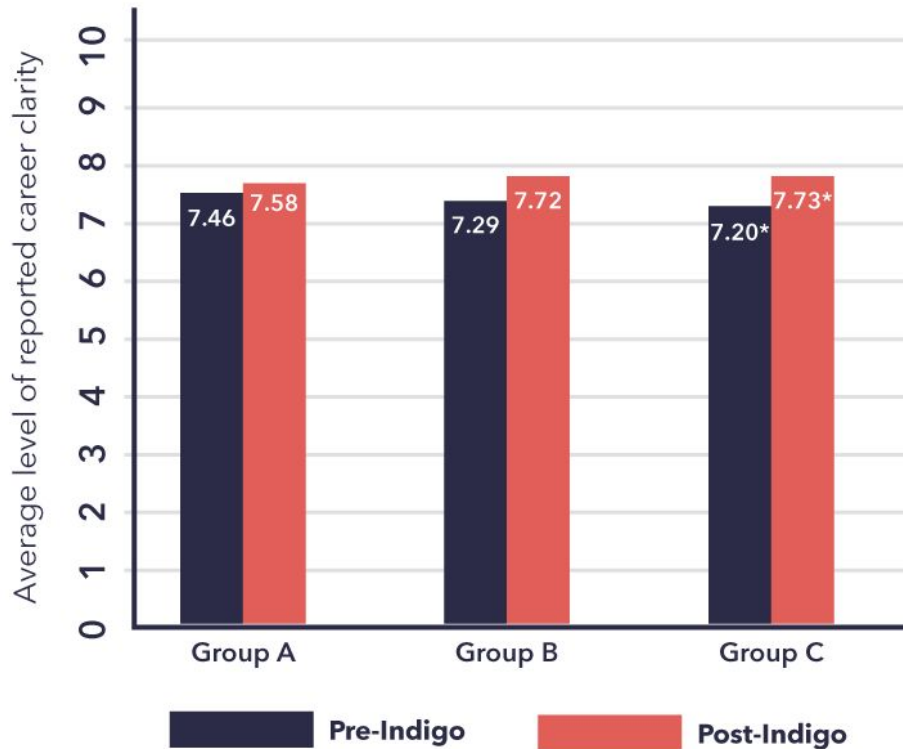*Before and After Indigo, by Study Group*

Figure 2 illustrates the *effect* of Indigo on career clarity. The correlation described above and shown in Figure 1 only shows that Indigo users with teacher instruction reported more career clarity than Indigo non-users and Indigo users that didn't receive teacher instruction, but a correlation does not suggest that Indigo was the *reason* for the difference between groups. This is because no other possible explanations for change were controlled or accounted for. By controlling for some other predictors (i.e. GPA, age, parent's level of education, etc.) and using a difference-in-difference model, we can test whether the difference in reported change of career clarity between the treatment and control group is meaningful and not simply a matter of chance. That is, we can determine whether the reported change in career clarity was, in part, *due to* Indigo and not something else.

While no effect of Indigo was discovered by comparing the whole population of Groups A, B, and C, there were three subsets of the population where Indigo appears to have a meaningful effect: 1) among boys, 2) among students that reported high levels of pressure and 3) among students that reported low levels of confidence in their plans for after high school. Figure 2 illustrates the effect of Indigo on career clarity *among boys.* The solid red line shows the actual average increase in career clarity among boys in Group C, which is the largest increase compared to the

other two groups, and shows an increase from about 7.2 to 7.75—a 7.6% increase. The solid green line shows the actual average increase in career clarity among boys in Group B, which is slightly less than the increase among boys in Group C. The solid black line shows the actual average increase among boys in Group A, which is very small. The dotted red line represents the "counterfactual" for boys in Group C; that is, it represents the predicted change the group would have experienced, on average, without the Indigo intervention. If boys in Group C (solid red line) had not used Indigo, they would have experienced a much smaller increase in career clarity. Thus, Figure 2 provides evidence that Indigo had a statistically significant positive effect on boys in Group C's level of career clarity, controlling for other explanations of change.

## Figure 2: Effect of Indigo on Career Clarity, on Boys
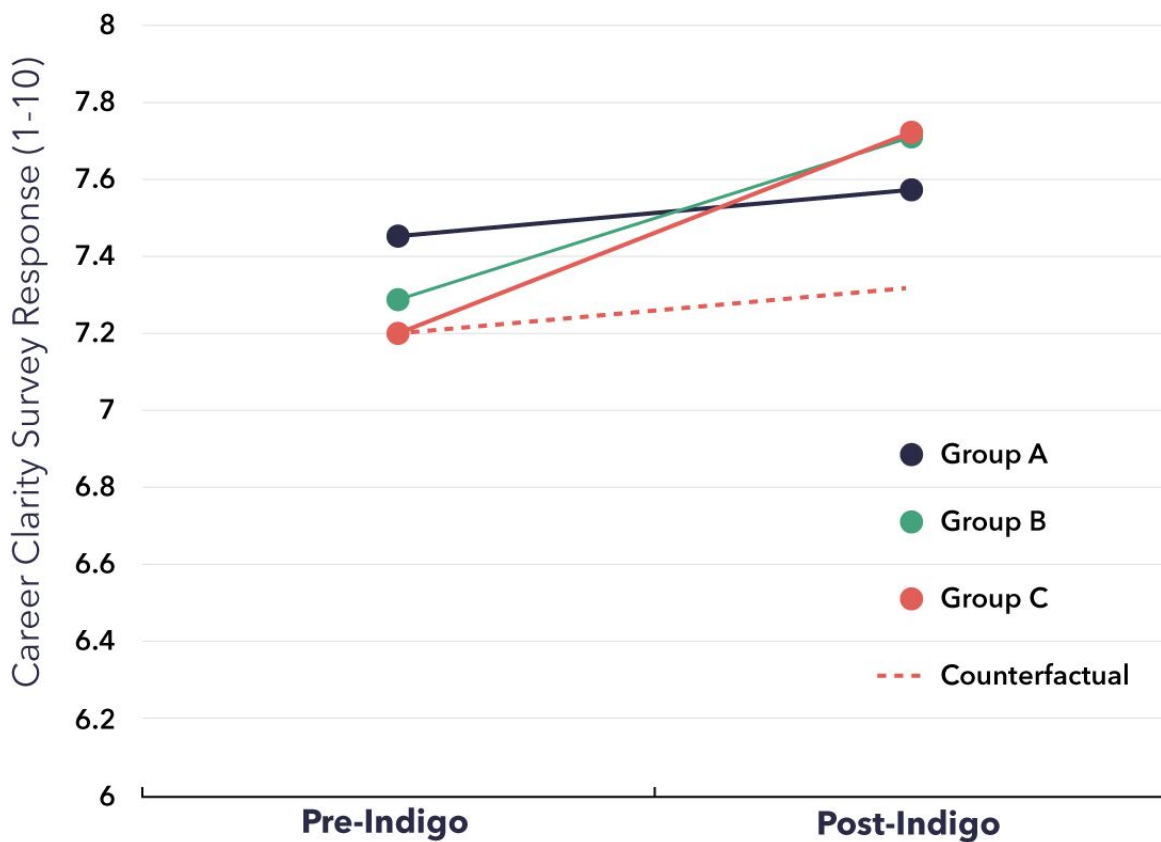
SOCIAL-EMOTIONAL HEALTH

There is no evidence in support of the second hypothesis, as Indigo users with and without teacher instruction did not report less stress after using Indigo or less stress in comparison to those students that did not use Indigo.

Figure 3 illustrates the average change in reported level of stress for Groups A, B, and C, as measured by the survey question "In the last week, how often have you felt nervous and "stressed"?[2] Contrary to expectations, Group A—the control group—reported less stress at the end of semester, although the decrease is not statistically significant. Students in both Groups B and C - the treatment groups - reported, on average, higher levels of stress at the end of the semester than before, although those increases are also not statistically significant. Consequently, there was also no evidence that Indigo had an independent *effect* on stress.

Figure 3: Average Level of Reported Stress

	Pre-Indigo	Post-Indigo
Group A	3.7	3.6
Group B	3.3	3.7
Group C	3.7	3.8

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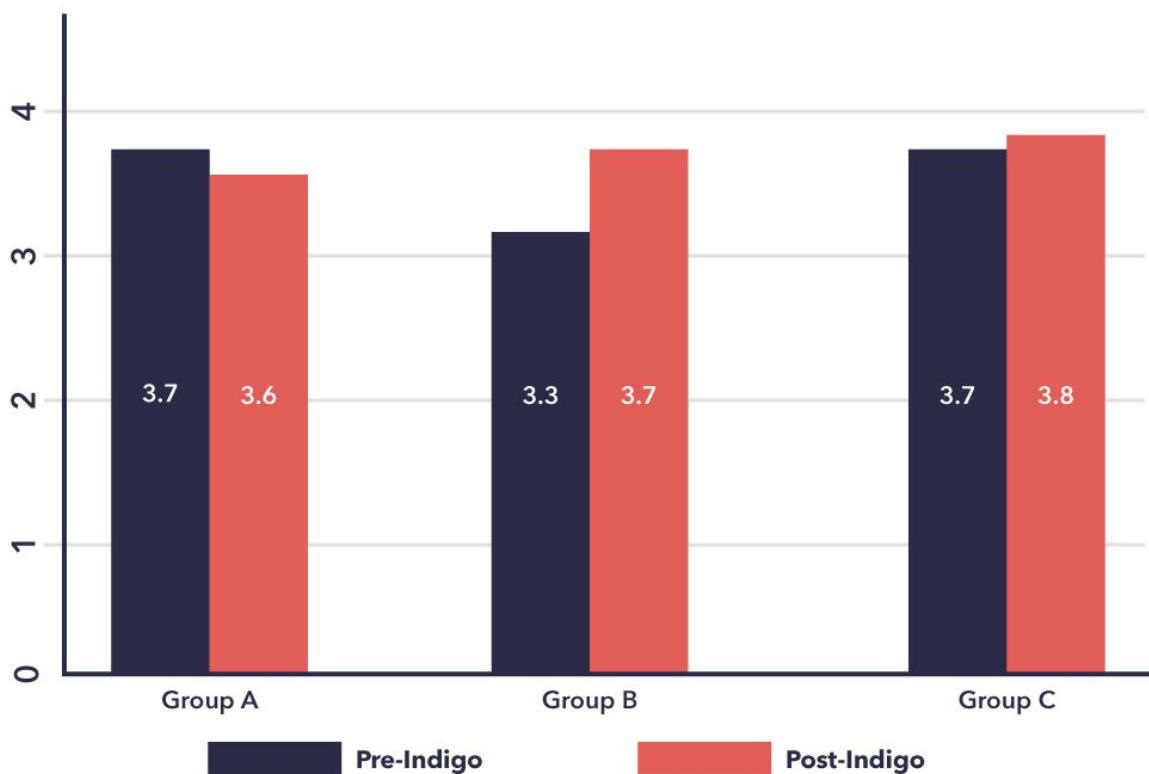
[2] There were no statistically significant changes among the other survey questions related to stress, either as individual variables or as indexes.

There is, however, evidence of an indirect effect of Indigo among students that have high levels of stress or pressure. While there was no evidence that Indigo was correlated with less stress among students, there is some evidence that Indigo increased career clarity among students in Group C that reported higher levels of "pressure or stress to know what [their] plan after high school is?"

In sum, therefore, there is some evidence that Indigo—in conjunction with teacher instruction—can help students who feel significant amounts of pressure and stress about their plans develop more career clarity. While Indigo on its own may not lower stress, Indigo does appear to be a useful tool for those students with high levels of stress.

ANECDOTAL EVIDENCE

There is some anecdotal evidence that highlights a couple key ways Indigo was beneficial for students. To collect anecdotal evidence, once a month for three months, focus groups of four students were held to collect feedback on how they felt Indigo was impacting them as well as to gain insight into product modifications (see below). Additionally, on the post-survey, students in Groups B and C—those students that used Indigo—were asked about ways in which the Indigo Assessment impacted them. **Taken together, the results from the qualitative interviews and the quantitative data on the post-survey reveal two key benefits of Indigo for students: 1) understanding themselves and 2) a means for communicating about themselves.**

The first way that Indigo was useful to students was that it helped them understand themselves better. Table 2 presents the descriptive results from the post-survey on six ways the Indigo Assessment could have impacted students. The majority of students in Groups B and C, 54% and 65% respectively, reported that the Indigo Assessment "gave them accurate results." The qualitative interviews confirmed that students felt like the results did, in fact, reflect the character traits they already believed themselves to have, which they said helped them "understand themselves" a bit more.

The other main way that the Indigo Assessment was useful to students was that it helped them communicate about themselves. About a third of the students (36%) in Group B and 42% of students in Group C reported that the Indigo Assessment "gave them language to talk about their unique qualities." Students in the focus groups explained that it was often times hard for them to communicate with their parents, teachers, and even peers about their strengths or about "how they operate," and Indigo gave them the tools to do so. Ultimately, Indigo validated their own strengths, passions and skills.

Table 2: Percent of Indigo users who said that the Indigo Assessment:						
	gave them accurate results.	gave them career ideas	gave them language to talk about their unique qualities	gave them confidence	lowered their stress about school	lowered their stress about their plans after high school
Group B	54%	33%	36%	21%	10%	11%
Group C	65%	33%	42%	29%	13%	15%

There is also some anecdotal evidence from teachers that supports how Indigo was a useful communication tool for students. Once a month, about 3-5 teachers were interviewed either individually or in pairs. Most teachers reported that the Indigo Assessment content was useful in a way that they could easily relate and integrate into their coursework and conversations with students. Four teachers reported that they perceived that students have a better understanding of themselves in relation to others, especially as it relates to group dynamics. As one example, a teacher shared that two students were having trouble completing an assignment together. After they took the Indigo Assessment, they shared with each other the results and realized how they were different from each other and how that was inhibiting their efforts. They talked about how they could build on each other's qualities and the teacher said they worked much better together after that.

PRODUCT MODIFICATIONS

The third goal of this research study was to gather feedback from the teachers and students about product usability and implementation requirements. Both teachers and students really liked the Indigo Assessment in and of itself. As described in the Anecdotal Evidence section above, the added-value of the Indigo Assessment is that it helps students identify and/or validate their unique strengths and interests and gives them the language to communicate with others about themselves. Students were less enthusiastic about the online learning modules and said they were too repetitive and long, so they suggested that the modules be made shorter and emphasize the key takeaways. Students also wanted the chance to take the modules in any order they wanted.

Teachers agreed that the online modules could have been more effective. They wanted to have more tips for enrichment activities or ideas on how to incorporate modules into their classes. In response to the student and teacher feedback regarding learning modules, Indigo is redesigning the modules and developing additional supplemental materials for teachers.

DISCUSSION AND NEXT STEPS

This study yielded preliminary evidence that suggested Indigo had a positive effect on career clarity, especially among boys. There are a couple of limitations in this study that warrant discussion.The primary data collection method was student responses on a pre- and post-survey, which has some drawbacks. While the sample size was quite large and representative, the timeframe was relatively short, especially when measuring changes in social-emotional outcomes. Factors like stress, trust, and self-awareness likely take longer than 10 weeks to demonstrate significant change. It is also the case that the post-survey occurred at the end of the semester when students' final exams were being completed while the pre-test occurred toward the beginning of the semester, so the contexts were different and not equal, which likely biased results related to social-emotional outcomes. In general, in future research, more objective measures of social-emotional outcomes should be used to avoid potential bias from student self-reporting. Further qualitative research could also reveal direct or indirect effects of Indigo on social-emotional outcomes.

Finally, future research could evaluate long-term impacts of Indigo on students after high school. Since Indigo's added-value appears to be with career clarity and direction, it would be good to know in what ways the Indigo Assessment and supplemental materials aid students post-high school. A more comparative contextual analysis would be insightful as well. By conducting similar evaluations of student outcomes across contexts (i.e. urban/rural,

resourced/under-resourced, demographic differences), it would reveal under what conditions Indigo is most impactful for each type of context.

Despite these limitations, there is solid preliminary quantitative evidence and positive anecdotal evidence to warrant a larger efficacy study of Indigo.

CONCLUSION

Blue Valley CAPS, and Dr. Fry in particular, are grateful for the opportunity to co-design Indigo for their school and are excited about the potential it has to develop student confidence in their unique skills and passions. This study showed that students who used Indigo reported, on average, more career clarity than students who did not use Indigo. Furthermore, the statistical analysis provides evidence that Indigo explains, in part, the positive increase in career clarity among boys. While the evidence is limited by survey bias, the preliminary positive evidence this study did find combined with the positive anecdotal evidence lends support for a larger, more robust research study. Indigo also proved to be a responsive partner in co-design with the school, as it is working to upgrade their learning modules and teacher dashboards.