FITW Annual Progress Report Narrative – September 15, 2016
John Carroll University – Grant # P116F150059

Linked Learning and Early Warning Approach for At-Risk Student Success (LLASS)

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Summary of Year 1 activities (2015-2016)

This report details our learning experiences, the collaborative efforts involved in launching the project, and the progress made throughout the first year of the grant. During year 1, the primary focus was on planning for the implementation of the First in the World project. Among the activities, was a local search for a project coordinator, for which we received 30 applications primarily from candidates with masters or doctoral credentials. Additionally, we submitted and received approval of our IRB protocol; and set-up our grants accounting. Also, 30 full time and adjunct faculty who teach freshmen foundational courses in Biology, Economics, Communication, Theology and Religious Studies, and English completed a series of three faculty development workshops, and collaborated to develop our catalog of aligned courses that constitute our intervention tool. Academic Advising, the Registrar's Office, Admissions and Enrollment, the Office of Student Engagement, and a number of other faculty and staff colleagues, including, the Office of Sponsored Programs, Business and Finance, and Provost's Office Budget Management also made significant behind-the-scenes collaborative efforts.

Fifteen members of the John Carroll University "project resource team" representing a broad spectrum of colleagues including faculty, academic advising, and student engagement, completed the 20 hours Emotional Intelligence Certification that prepared them to administer and interpret the EQ-i 2.0 and provide feedback to students' advisors on the results of the EQ-i 2.0, as one element in our plan to enhance academic advising. Current research demonstrates a tangible link between student Emotional Intelligence scores and likelihood to succeed in a college environment (e.g., Romanelli et al., 2006).

Additionally, during the fall semester, 2015, the project director gave a presentation at a well-attended faculty council meeting to provide an overview of the project, and to address questions and concerns about the implementation of the project, and any potential impacts the project might have on their courses. During a lively Q&A session following the presentation, the project co-director responded, and clarified how the entering students would be assigned to the intervention courses, and summarized how the new process of block registration would work.

Prior to the start of the series of New Student Orientation sessions, the project director presented an overview to approximately 40 faculty academic advisors. Based upon their comments and concerns, a FAQs was developed for the advisors to use during freshmen orientation.

Throughout the summer, 2016, a new process was implemented to register freshmen for required core courses prior to their arrival on campus for one of eight scheduled New Student Orientation sessions (NSO). The goal of this enhanced registration process was to ensure that all students had the same access to foundational coursework (English 120 or 125, Communication 125, or Quantitative Analysis courses) for the new Integrative core;

regardless of the NSO session they attended. Students that were identified as being eligible for the intervention were placed in aligned courses as part of the FITW project goals. The effort it has taken to implement the FITW grant is a tremendous example of John Carroll University (JCU) staff and faculty members' extraordinary commitment to student learning.

Goal of the Study

This project aims to identify factors associated with student success and thriving among a population of first-year freshmen identified as being "at risk," measured by a construct of predicted academic difficulty. We apply the concept of "aligned learning communities" and collaborative course development as our intervention that consists of a series of aligned foundational courses, linked by common themes and assignments.

The resulting catalog of aligned courses includes Biology, English, Oral Communication, Theology and Religious Studies, and Economics. The hypothesis is that compared to freshmen enrolled in foundational courses under the standard or "business as usual" model, those freshmen enrolled in aligned learning communities will show positive effect on the outcome measures such as accumulated course credits, persistence, raw GPA, and adjusted GPA. The College Student Inventory (CSI) composite measure of predicted academic difficulty was used to determine placement into the intervention or comparison groups.

What Are Linked or Aligned Courses?

Kellogg (1999) states that linked or aligned courses put together a cohort of students with two common courses. One course is typically content-based (science, math) and the other is an application course (writing, speech). The faculty of each course may teach independently or together and coordinate syllabi and assignments so that the classes compliment each other. The Linked Courses Model provides a shared experience for students that focus on a content-based course that is actively supported by a skills course.

Study Characteristics

Intervention Condition – Students are block registered into a pair of aligned foundational courses that are linked by common themes and assignments, thus forming a cohort-based, interdisciplinary learning community. These courses were developed during a series of faculty workshops conducted prior to implementing the intervention. An example of this alignment is the Biology and Oral Communication pair, where the common assignments includes each student demonstrating skills with a series of presentation styles, such as informative, or persuasive. A goal of this set of aligned courses is to prepare students in natural science courses to more effectively communicate to diverse audiences, and in diverse settings.

Comparison Condition – Students in the comparison group consist of those freshmen not identified as having "predicted academic difficulty," as indicated by results of the College Student Inventory (CSI). This group of students is block registered in a "business as usual manner" for similar pairs of stand-alone foundational courses as those taken by the students in the intervention group.

Most notable is that courses taken by students in the comparison group are not aligned or linked in any way. Faculty teaching these courses to the comparison group have not

collaborated to develop common themes or assignments. In effect, the comparison group is not enrolled into any "learning communities."

Setting – A four-year private Liberal Arts institution in Northeast, Ohio, with an undergraduate population of approximately 3,000.

Participants – All enrolling first-time, first-year freshmen other than Arrupe Service Scholars or Honors Program students at John Carroll University.

Study Design and Analysis

Sample formation - Participants in the intervention and control groups were determined using a forcing variable, "Predicted Academic Difficulty," which is a composite index in the College Student Inventory (CSI) that uses a Stanine scale of 1-9, with 5 as the mean, and standard deviation = 2.

Higher scores on Predicted Academic Difficulty indicate greater risk of difficulty. The major scales of the CSI include: receptivity to academic assistance, academic confidence, attitude toward educators, career closure, receptivity to career counseling, desire to finish, desire to transfer, family emotional support, receptivity to financial guidance, opinion tolerance, receptivity to social enrichment, self reliance, study habits, sociability, math and science confidence, verbal and writing confidence.

The benefit of the College student Inventory (CSI) is that it provides a survey instrument that can be used proactively to help improve student retention (Schreiner, 1991). The CSI is comprised of Likert-type items consisting of 19 independent scales. Each item uses a Likert scale of 1 to 7 with 1 equaling "Not At All True" and with 7 meaning "Completely True."

The 19 scales of the College Student Inventory are designed to identify those predispositions and precollege experiences and attributes, which may subsequently influence the student's ability to succeed and persist in college. In addition, the College Student Inventory report contains demographic information about the student and a list of prioritized recommendations for intervention, weighted on the basis of the student's need for campus service and expressed desire for service (Schreiner, 1991).

Used as an "early warning system," the CSI can accurately identify at-risk students for intervention.

A student is considered "average" or "near the mean" if the Stanine score is 4,5, or 6. After careful consideration, we chose "4" as our cut-score because our study also is informed by the literature on the "murky middle," which suggests that 45% of total dropouts nationwide finish a year of college and with a grade-point average between 2.0 and 3.0 (Venit – Educational Advisory Board – The "Murky-Middle Project," 2014). The CSI's independent scales have an average homogeneity coefficient (coefficient alpha and Spearman-Brown split-half reliability) of .81.

The CSI compares favorably to several well-respected personality inventories. Jackson's Personality Research Form (PRF Form E, 16 items per scale, N=84) obtained an average

homogeneity coefficient of .72. The Meyers-Briggs Type I indicator, used by many college counseling centers, has an average coefficient alpha reliability of .81, while the California Psychological Inventory (CPI), respected by psychologists, has an average coefficient alpha reliability of .72 (USA Group Noel-Levitz, 1993). With this solid homogeneity as a base, the CSI's stability (test-retest reliability) is also quite good (Noel-Levitz, 1993).

Study Data

Pre-intervention Data – Baseline Sample – All entering freshmen that completed the College Student Inventory (N=722) and attended New Student Orientation (See table 1).

- High Need Students – Among the students in our baseline sample, 22.8% (N=152) are Pell recipients.

- First-generation College Students – Of our baseline sample, 12.3% (N=82) are first-generation students.

Pre-intervention Data – Analytic Sample – Those students eligible for the study (N=667) who will be enrolled in the standard foundational courses (See table 2). The analytic sample excludes Arrupe Service Scholars and Honors students (N=59) who are enrolled in specifically designated foundational courses.

- High Need Students – Of the students in the intervention group, 24.5% are Pell recipients (N=95); and among those students in the comparison group, 20.4% are Pell recipients (N=57).

- First-generation College Students – In the intervention group, 13.4% (N= 52) are first-generation, while 10.8% (N=30) of the comparison group is first-generation college students.

Post-intervention data and findings – N/A at this time.

A general description of key data for the John Carroll University (JCU) class of 2020 is shown in Table 1. Of note, is the average B+ high school GPA, as well as the more than 22% of entering freshmen who received Pell grants as financial aid (see Table 2), which can be considered as one measure of JCU's commitment to economic diversity.

This proportion of the JCU freshmen class receiving Pell grants compares favorably to top 25 ranking of the U.S. News and World Report, wherein, if JCU were included, would place us ahead of Harvard (19%) and MIT (18%) (U.S. News and World Report, n.d.)

Table 1 - Pre-Intervention Sample Sizes and Characteristics of the Baseline Sample (N=722)

	Characteristics of Entering Freshmen Class			
Baseline Measures		***Sample Size***	***Sample Characteristics***	
	Unit of Assignment	**Unit of Analysis**	**Mean**	**Standard Deviation**
HS GPA	Standard Foundational Courses (N=2)	Individual Student (N=662)	3.52	.519
ACT Math[1]	Standard Foundational Courses (N-2)	Individual Student (N=556)	23.89	4.0
SAT Math	Standard Foundational Courses (N=2)	Individual Student (N=250)	545.48 (23 ACT)	78.23 (~5.3 ACT)
			Percent of Sample	
Pell Recipients	Standard Foundational Courses (N=2)	Individual Student (N=152)	22.8%	N/A
First Generation	Standard Foundational Courses (N=2)	(N=82)	12.3%	N/A
Males	Standard Foundational Courses (N=2)	Individual Student (N=382)	52.9%	N/A
Females	Standard Foundational Courses (N=2)	Individual Student (N=339)	47%	N/A

As shown in Table 2, a majority (58.2%) of the project-eligible entering freshmen were assigned to the intervention group.

Table 2 – Frequency Distribution of Intervention and Comparison Groups

Intervention or Comparison Group					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Comparison Group	279	38.4	41.8	41.8
	Intervention Group	388	53.4	58.2	100.0
	Total	667	91.9	100.0	
Missing	Not eligible	59	8.1		
Total		726	100.0		

[1] Some students took both the ACT and SAT examines, thus accounting for the differences in the counts.

Not surprisingly, being a first generation college student is significantly associated with receiving a Pell grant (.286, p <. 001). Moreover, approaching significance (p = .064) was the association between receiving a Pell grant and predicted academic difficulty (Table 3).

Table 3 – Correlations with Predicted Academic Difficulty

		First Generation	Pell Recipient	Predicted Academic Difficulty
First Generation	Pearson Correlation	1	.286**	.056
	Sig. (Two-tailed)		.000	.150
	N	667		666
Pell Recipient	Pearson Correlation	.286**	1	.072
	Sig. (Two-tailed)	.000		.064
	N	667	667	667
Predicted Academic Difficulty	Pearson Correlation	.056	.072	1
	Sig. (Two-tailed)	.150	.064	
	N	666	666	666
High School GPA	Pearson Correlation	-.014	-.030	-.625**
	Sig. (Two-tailed)	.725	.437	.000
	N	662	662	661

Not shown in Table 3 are the correlations between ACT/SAT scores and Predicted Academic Difficulty, Pell recipient, or first-generation student. As expected, higher test scores were significantly correlated with less risk for Predicted Academic Difficulty. Moreover, higher ACT English, Math, and Reading scores were significantly associated with less likelihood of being a Pell recipient. Further, the SAT math, verbal, and writing scores were significantly associated with being a Pell recipient or a first generation student.

Table 4 - Pre-Intervention Sample Sizes and Characteristics for the Analytic Sample (N=667)

	Intervention Group	Intervention Group	Intervention Group	Intervention Group	Control Group	Control Group	Control Group	Control Group
Baseline Measures	***Sample Size***	***Sample Size***	***Sample Characteristics***		***Sample Size***	***Sample Size***	***Sample Characteristics***	
	Unit of Assignment	**Unit of Analysis**	**Mean**	**Standard Deviation**	**Unit of Assignment**	**Unit of Analysis**	**Mean**	**Standard Deviation**
HS GPA	Aligned Foundational Courses (N=2)	Individual Student (N=387)	3.29	.488	Standard Foundational Courses (N=2)	Individual Student (N=275)	3.82	.394
ACT Math	Aligned Foundational Courses (N=2)	Individual Student (N=308)	22.74	3.79	Standard Foundational Courses (N=2)	Individual Student (N=248)	25.32	3.801
SAT Math	Aligned Foundational Courses (N=2)	Individual Student (N=149)	528.93 (21 ACT)	77.312 (~5.3 ACT)	Standard Foundational Courses (N=2)		569.90 (23 ACT)	73.37 (~5.3 ACT)
			Percent of Sample				**Percent of Sample**	
Pell Recipients	Aligned Foundational Courses (N=2)	Individual Student (N=95)	24.5%	N/A	Standard Foundational Courses (N=2)	Individual Student (N=57)	20.4%	N/A
First Generation	Aligned Foundational Courses (N=2)	Individual Student (N=52)	13.4%	N/A	Standard Foundational Courses (N=2)	Individual Student (N=30)	10.8%	N/A
Males	Aligned Foundational Courses (N=2)	Individual Student (N=229)	59%	N/A	Standard Foundational Courses (N=2)	Individual Student (N=128)	46%	N/A
Females	Aligned Foundational Courses (N=2)	Individual Student (N=159)	41%	N/A	Standard Foundational Courses (N=2)	Individual Student (N=150)	54%	N/A

As previously noted, more than 22% of the entering freshmen class is a Pell recipient. In terms of our analytic sample, we show in Table 4 that 24.5% of the intervention group is Pell recipients. While the comparison group consists of 20.4% Pell recipients.

Predicted Academic Difficulty and General Characteristics of the Project Sample

Gender

For the overall pre-intervention sample, Men (n=382) demonstrated higher predicted academic difficulty, averaging 3.99 (SD=1.79) compared with women (n=339) at 3.55 (SD=1.61). A t-test of equality of the means indicates statistically significant gender difference in the means (t = -3.56, p < .001).

Ethnicity

Black/African American students (n=35), on average have higher predicted academic difficulty score, at 4.85 (SD=1.62), compared with non-black students (n=669), at 3.73(SD=1.71). A t-test of equality of the means indicates statistically significant difference (t = -3.74, p < .001).

In the table below, the distribution of Stanine scores and corresponding percentile ranges are shown for the analytic sample. As illustrated, most students scored in the 23 - 39 percentile range.

Table 5– Distribution of Scores for Predicted Academic Difficulty (PAD)

PAD Score	Corresponding Percentile Range	Frequency	Percent	Cumulative Percent
1	3 and below	55	8.3	8.3
2	4 – 10	100	15.0	23.3
3	11 – 22	121	18.2	41.4
4	23 – 39	163	24.5	65.9
5	40 – 59	110	16.5	82.4
6	60 – 76	74	11.1	93.5
7	77 – 89	27	4.0	97.6
8	90 – 95	13	2.0	99.5
9	96 and above	3	.5	100.0
Total		667	100.0	

Typical of the John Carroll University student body, Table 6 shows that the analytic sample is about 80% white, with around 11% of the analytic sample self-identifying as students of color.

Table 6 – Analytic Sample Distribution of Race/Ethnicity Using IPEDS Classifications

IPEDS RACE CATEGORIES					
		Frequency	Percent	Valid Percent	Cumulative Percent
Race Ethnicity	White	541	81.1	81.1	81.1
	Black or African American	31	4.6	4.6	85.8
	Hispanic	33	4.9	4.9	90.7
	Asian	20	3.0	3.0	93.7
	Multi-racial	11	1.6	1.6	95.4
	American Indian or Alaskan Native	2	.3	.3	95.7
	Non-resident Alien	14	2.1	2.1	97.8
	Other	15	2.2	2.2	100.0
	Total	667	100.0	100.0	

Further insight into our analytic sample – Prior to the treatment, we evaluated our intervention and comparison groups on several academic achievement, demographic, and socioeconomic measures including high school GPA, SAT/ACT scores, gender, family financial status (e.g., Pell recipients), and first-generation college student. The standardized

mean difference effect size for high school GPA was calculated using Cohen's *d* = 1.19, indicating a *substantial difference*.[2]

$$d = (3.82 - 3.29)/\sqrt{(.39^2 + .49^2)/2} = 1.19$$

The effect sizes of mean difference in other academic achievement measures indicate a *modest difference* across the intervention and comparison groups. Cohen's *d* calculations resulted in the following: SAT-math (*d* = .54), ACT-English (*d* = .57), SAT-writing (*d* = .62), ACT-math (*d* = .68), and SAT-verbal (*d* = .69). In accordance with the What Works Catalog Standards, similarity of the groups is demonstrated when the effect size < or = .05, but not greater than 0.25.

These differences in academic achievement measures were expected, given that our intervention group consists of those students with greater predicted academic difficulty.

Comparing the samples on the binary measures first-generation (yes/no), Pell recipient (yes/no), and gender (male/female), we conducted Mann-Whitney U procedure to test the hypothesis that there is no difference in the distribution of these characteristics across the intervention and comparison groups. Retaining the null hypothesis indicates similarity across the intervention and comparison groups on those values (see Table 6 below).

Table 6 – Independent Samples Test of Difference: Intervention and Comparison Groups.

Null Hypothesis	Test	Sig.	Decision
The distribution of First-generation students is the same across categories of the intervention and comparison groups	Independent samples Mann-Whitney U test	.304	Retain the null hypothesis
The distribution of Pell-recipient students is the same across categories of the intervention and control groups	Independent samples Mann-Whitney U test	.219	Retain the null hypothesis
The distribution of gender is the same across categories of the intervention and control groups	Independent samples Mann-Whitney U test	.001	Reject the null hypothesis

In addition to the Mann-Whitney tests, we calculated the Cox Index effect size by first computing the log odds ratios, then applying the calculation $LOR_{Cox} = LOR/1.65$.

The Cox Index is interpreted in the same manner as Cohen's *d.* As the Cox results show (see below), there is a small or trivial difference between intervention and comparison group in terms of first-generation students, Pell recipients, and gender.

[2] Cohen's *d* effect size threshold - .20 -small difference, .50 - medium difference, .80 - large difference, 1.30 - very large difference (See Ellis, 2009).

- $Cox_{First\ Generation}$ = .15 – trivial difference
- $Cox_{Pell\ Recipient}$ = .14 – trivial difference
- $Cox_{gender\ distribution}$ = .20 – small difference

The baseline measures will be included as covariates in our statistical models to reduce bias in the estimate of the effect of the intervention. Statistical adjustments may include regression adjustment or ANCOVA (see WWC Standards Brief). After we collect post-test data, *if there is high attrition* (see *Review Protocols for Studies of Interventions to Support Postsecondary Success, version 3.0, p. 8*), we will then examine baseline equivalence near the cut-point, in accordance with standard 3, criterion A in the *Preview of Regression Discontinuity Design Standards, 2015*.

Outcome Measures – As specified in Evaluator's Logic Model:

- *Faculty Development Workshops* – During the Spring 2016 semester, a series of three workshops were conducted with the goal of identifying appropriate cross-discipline partners, for which aligned courses would be developed. During the initial session, the project goals were presented, and faculty collaborators discussed the essential learning outcomes for their respective foundational courses. Subsequently, these subject matter experts paired across disciplines to begin discussions of ways to develop alignments. The outcome of the workshops was a catalog of aligned courses that will be offered each fall semester during the grant. To facilitate development of aligned courses, during the workshops, brief presentations were given on the following topics:

    - Using Linked Courses in the General Education Curriculum.
    - Linking the Classroom and Community Through Service Learning.
    - Syllabus Development, Learning Outcomes, and Aligned Partner Work.
        - (More information is available on our project website: http://sites.jcu.edu/fitw/home-page/resources/

- *Administration of the CSI and determination of "forcing variable" and cut score*. The determination of the intervention and comparison groups was by design using a "forcing variable," rather than by random assignment or unobserved self-selection. The "forcing variable" is a composite scale within the CSI, "Predicted Academic Difficulty" that is a continuous variable scaled from 1-9. The project team determined the cut-off score for the "forcing variable" prior to placement of students into the intervention and comparison groups.

- *Registration of students into intervention and comparison groups.*
  At John Carroll University typically one third of incoming class intends to major in Biology or Chemistry, one third intends Business, and the rest are Humanities and Social Sciences. Because of this distribution we identified introductory biology and introductory economics as important participants in the course alignment. Humanities and Social Sciences do not have required courses for their majors. Therefore, for those students we selected a pair of required core courses for the alignment.

When course schedules were prepared last winter, Chairs of the departments participating in our project were asked to assign half of their first year sections for the intervention. Department Chairs were surveyed to ascertain which courses they recommended for their potential majors, this information was used when pre-registering students in aligned courses (either because the aligned course was required for the major or to make sure the aligned courses did not block times for required major courses.) In collaboration with the offices of the Registrar and Academic Advising we created 20 pairs of aligned courses. Similar pairs of courses (not aligned) were also established.

We surveyed admitted prospective students to verify their career interests (possible mayor(s) and minor(s)), sports commitments, AP credit, college credit, and other possible constrains to their schedule. Based on that information students were pre-registered in two courses, which will fulfill core and/or major requirements. When students attended on-campus orientation they worked with an academic advisor to finish their registration, they had the opportunity to make changes if necessary, but we made sure they conserved an aligned pair of courses in they needed it.

The process worked smoothly with only a few students needing to be excluded, since they did not require the foundational courses in the study. One difficulty we encountered was that enrollment caps for some courses are different, for example English125 is capped at 15 students but Communication 135 is capped at 18. Having to cap the Communication sections at 15 caused the need for extra sections, which was challenging. We will revise the alignment to look at alternative or additional combinations of courses.

- *Administration of pre-and post-test instruments* – Prior to attending New Student Orientation, all freshmen that registered for one of the eight NSO sessions conducted between June-August, completed the CSI survey at home, prior to attending NSO. Completion of the CSI prior to NSO facilitated the creation of the intervention and comparison groups, and allowed the Registrar to enroll students into the aligned or non-aligned courses prior to attending NSO, thus assuring placement into essential foundational courses based upon major, undeclared, or other factors, such as varsity teams fall practice schedules. During day two of NSO, each student completed the EQ-I 2.0 and TQ surveys. The CSI and TQ will also be administered as post-test during mid-term of spring semester. What follows is a brief description of the EQ-I 2.0 and TQ surveys:

  > The EQ-i 2.0 Emotional Intelligence Survey is an essential tool to help identify those student skills and abilities that are critical for adapting to the college environment, such as developing a social support network, adjusting to new academic expectations, and acquiring the intrinsic motivation for accomplishing personal and career goals. The instrument measures factors such as Self-Regard, Emotional Self-Awareness, Assertiveness, Independence, Self-Actualization, Empathy, Social Responsibility, Interpersonal Relationships, Stress Tolerance, Impulse Control, Reality Testing, Flexibility,

Problem Solving, Optimism, and Happiness (see https://www.mhs.com/eihe.aspx).

- *The Thriving Quotient™ (TQ)* is an instrument that was developed to measure the academic, social, and psychological aspects of a student's college experience that are most predictive of academic success, institutional fit, satisfaction with college, and ultimately graduation. The 25 items on the TQ cluster onto 5 scales (see http://www.thrivingincollege.org/the-thriving-quotient):
  - *Engaged Learning* – a measure of the degree to which students are meaningfully processing what happens in class, energized by what they are learning, and continuing to think about it outside of class
  - *Academic Determination* – a measure of students' goal-directedness, investment of effort, and regulation of their own learning and use of time
  - *Positive Perspective* – a measure of students' optimism, and explanatory style
  - *Social Connectedness* – a measure of students' involvement in healthy relationships and social support networks, whether on or off campus
  - *Diverse Citizenship* – a measure of students' desire to make a difference in the community around them, as well as their openness to differences in others

- *Enhanced Academic Advisement* – Starting with the fall semester 2016, we will begin planning how to use the data from the three surveys (CSI, EQ-I 2.0, and TQ) to enhance our academic advising and outreach to students. This data-driven approach will augment other indicators such as class attendance, progress on assignments, or earned grades. We plan to develop a series of guiding questions from each of the surveys to facilitate general advising for students. Additionally, where appropriate, we will draw from specific student's responses to develop a more precise and individualized set of guiding questions for the advisor.

- *Develop "low cost" predictive early alert system* - In the fall, 2016, we will begin conversations with the "**Dashboards, data, and digital taskforce**" that was recently created. We need to ascertain what data we presently have, where these data are located (multiple platforms), and what data is needed that is not presently available?

- *Evaluator Interviews with project team and others* (see themed responses in section titled, "Process Evaluation")

Analytic Approach. To test the effect of the intervention we use a "sharp" regression discontinuity design (RDD). Recognizing that the WWC standard for RDD indicates that there must be four values on each side of the cut-score, the project team determined that If we adhere to that standard, we are then compelled to use "5" as our cut score, which is not intuitive to us, and in effect is contrary to our plan to capture students in the "murky middle."

Our understanding of Stanine scale is that each Stanine score also represents a percentile boundary or width (lower and upper limits) equal to one-half of a standard deviation. In order to meet the WWC standard of four values on each side of the cut-score, we express the Stanine scores as z-scores.

For example, the boundaries for Stanine 5 are equal to -.25 and +.25, which correspond with the upper boundary of Stanine 4 and the lower boundary of Stanine 6, respectively.) To get the other boundaries, we successively add .50 to Stanine 5's upper boundary to get the upper boundaries for Stanines 6, 7, and 8. Conversely, we successively subtract .50 from Stanine 5's lower boundary, to get the lower boundaries of Stanines 4, 3, and 2. There is no upper boundary for Stanine 9 and no lower boundary for Stanine 1 because the normal curve, in theory, extends forever out toward positive and negative infinity.

Our initial thinking was that Z-scores would provide a good measure of a student's performance in relation to the mean performance of the class. The table below shows Stanine scores transformed into z-scores. The Stanines 2 to 8 each correspond to a range of 0.5 z-scores. See table 7, below.

Table 7– Conversion of Stanines to Z-Scores

Stanine	Percentage in normal population	Z-Score
1	4	Under -1.75
2	7	-1.75 to -1.25
3	12	-1.25 to -0.75
4	17	-0.75 to -0.25
5	20	-0.25 to 0.25
6	17	0.25 to 0.75
7	12	0.75 to 1.25
8	7	1.25 to 1.75
9	4	Over 1.75

If Stanines are obtained from a normal distribution of marks, we can evaluate the percentage of marks that will fall into each Stanine. These percentages are shown in the second column of the table above.

For smaller sets of marks, these proportions will be only approximate, but can be used as a guideline for interpreting the Stanines. We have discussed these methodological issues with our external evaluator, Dr. Melissa Demetrikopoulos, who suggests conversion of Stanines to z-scores as a statistically and mathematically sound approach.

In reviewing a number of scholarly articles on RDD, we cannot find any reference to a standard of four values on each side of the cut-score. Rather, at best, we found recommendation that the cut-score should not be at or near the extreme ends of a scale.

However, based upon a teleconference discussion with the Technical Assistance team on August 12, 2016, it was suggested that beyond conversion to z-scores, we could satisfy the requirement of four discrete values on each size of the cut-point by using the raw scores that were used to derive the Predicted Academic Difficulty Stanine scale.

A cross-tabulation of raw scores vs. derived scores shows many discrete raw scores for each of the points on the nine-point Stanine scale (data available upon request). We then converted each raw score to z-scores. We also translated the percentile scores for the derived Stanine into z-scores. To confirm the accuracy of these translations, we then converted percentile z-scores of the Predicted Academic Difficulty scores back into Stanines using the formula below:

*Stanine = (2 * z-score of PAD percentile) + 5*

This conversion of the z-scores to Stanines rendered the expect mean (5.0004), and standard deviation (2.0001), which is consistent with all Stanine scales *(data available upon request)*.

Yet, further consideration and consultation with the technical assistant team guided us to conduct additional analyses based upon greater insight into the problem of balancing each side of the cut-score of "4" with no less than four discrete values. Specifically, the technical assistance team indicated that, "as for your choice of metric to use for the cut point, it is easiest, safest, and most intuitive to use the raw score as the forcing variable. (Allan Porowski – Technical Assistance Team via email correspondence on August 15, 2016).

"Although an interpretation of the use of the z-score is that it would be a 1:1 transformation (and therefore, the correlation between the raw score and the z-score would be exactly 1), there is always a possibility that the WWC would not accept a forcing variable because it was weighted. Transforming the forcing variable would invite additional scrutiny, since it would not add anything to the analysis. The most straightforward solution is to use the raw score in the analysis " (Porowski, 2016).

As a result of this insight offered by the technical assistance personnel, we focused greater attention on the range of raw scores for Predicted Academic Difficulty, without transforming the raw scores into a standardized z-score. Table 8 shows each Stanine score bounded by the lower and upper range of raw scores.

Table 8 – Map of Predicted Academic Difficulty Raw Scores with Stanine Scale

LOWER RANGE OF RAW SCORES	STANINE SCORE	UPPER RANGE OF RAW SCORES
-52.957	1	-44.544
-44.509	2	-38.791
-38.653	3	-32.259
-32.138	4	-24.467
-24.404	5	-16.112
-15.985	6	-8.928
-8.451	7	-2.906
-2.594	8	1.488
4.059	9	4.625

Most importantly, it was critical to establish that the range of raw scores for Predicted Academic Difficulty was also perfectly correlated with the derived Stanine scores.

After reconciling and coming to agreement on the matter, the project team conceded that no transformation to z-scores is needed, and in fact, transforming the raw score to a z-score can be problematic because of the following eligibility criterion from the What Works Clearinghouse's Regression Discontinuity Design Standards:"

The forcing variable used to calculate impacts is the same as the forcing variable used to assign units to treatment status. The forcing variable used to calculate impacts must be the actual forcing variable, not a proxy or estimated forcing variable. A variable is considered to be a proxy if its correlation with the actual forcing variable is less than 1.

Table 9 shows the correlations of the range of PAD raw scores, PAD Stanine scores, and PAD percentiles. As shown, the correlation of PAD range of raw scores with PAD Stanine Scale is perfectly correlated and significant ($P < .001$), thus, the range of raw scores is not a proxy. These data also show that both the PAD percentile and PAD individual raw scores are indeed proxies for the PAD Stanine scale, since they are not perfectly correlated. Therefore, we assured that we meet the WWC standard outlined above regarding the forcing variable.

Table 9 – Correlations of Predicted Academic Difficulty Raw Scores Ranges with Predicted Academic Difficulty Stanine Scores

Correlations					
		Range of PAD raw scores	Predicted Academic Difficulty (Stanine Scale)	Predicted Academic Difficulty (percentile)	Predicted Academic Difficulty (individual raw score)
Range of PAD raw scores	Pearson Correlation	1	1.000**	.970**	.983**
	Sig. (2-tailed)		.000	.000	.000
	N	721	721	721	721
Predicted Academic Difficulty (Stanine Scale)	Pearson Correlation	1.000**	1	.971**	.984**
	Sig. (2-tailed)	.000		.000	.000
	N	721	721	721	721
Predicted Academic Difficulty (percentile)	Pearson Correlation	.970**	.971**	1	.991**
	Sig. (2-tailed)	.000	.000		.000
	N	721	721	721	721
Predicted Academic Difficulty (Individual raw score)	Pearson Correlation	.983**	.984**	.991**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	721	721	721	721
****. Correlation is significant at the 0.01 level (2-tailed).**					

Statistical Adjustments –When we conduct further data analyses, we will consider whether or how we need to adjust for unequal sample sizes.

Evaluation Progress

Changes or delays from original evaluation plan - There are no delays associated with the original evaluation plan, and the project is on track to maintain the proposed timeline. However, the original evaluation plan was framed within the context of a quasi-experimental design with aggregate matching of a non-randomized comparison group similar to the treatment group at baseline. After further consideration by the project team and external evaluator, a change in method was made to use a regression discontinuity design (RDD) and examine the effect of the intervention near the cut-off of the forcing variable. The difference in the regression line for the intervention group and the comparison group at the cutoff value of the forcing variable will be used to estimate the effect of the intervention. Despite this design change, there have not been changes made to the goals of the project.

Revision process for evaluation plan - The evaluation plan was revised and submitted to the FITW program staff and technical reviewers. Reviews of the plan have been received and are undergoing further consideration. In the proposal, we indicated that the project would administer five pre- and post-test surveys including: Learning and Study Strategies Instrument (LASSI), Student Development Task and Lifestyle Instrument (SDTLI), College

Success Factors Index (CSFI), Thriving Quotient (TQ) and a measure of emotional intelligence (EQ-I 2.0).

Upon further research on the instruments that were proposed, and a determination of the most valid and reliable measures, three instruments were chosen for the project including the College Student Inventory (CSI), Thriving Quotient (TQ) and the Emotional Quotient Inventory (EQ-I 2.0).

Application of What Works Clearinghouse standards - This development project will continue to meet WWC standards with reservations as proposed. Care has been taken to ensure that the evaluation will occur by What Works Clearinghouse standards. The project will meet the four standards necessary to be eligible for regression discontinuity design review. The WWC requirement that "the forcing variable is ordinal and includes a minimum of four or more unique values below the cutoff and four or more unique values above the cutoff" necessitated careful consideration, but has been met as described in the analytic approach section. To meet the standards with reservations, we plan to completely satisfy standard 1, and 2; partially satisfy standard 4; and anticipate that standard 5 will be waived because we are performing a sharp (rather than fuzzy) RDD.

Freshmen in either the Arrupe Service Scholars program or the Honors program are not eligible for participation in the project and were not placed into a condition due to the fact that these programs offer their own unique and specialized curriculum.

Challenges in implementing the evaluation plan - The greatest challenge we have experienced in implementing the evaluation plan was the prior assignment of Technical Assistance (TA) personnel to the project that were unfamiliar with RDD. This has been resolved with the assignment of a new TA individual, and appointment of new program officer in Washington, D.C.

Frequency of evaluation data collection - We will observe participants at two time periods, the pre-intervention time period, and at the end of the one-year intervention (post-intervention). Three cohorts of students will participate for one-year beginning fall 2016, Fall 2017, and Fall 2018 with recruitment occurring during the summer prior to their participation. The results of the College Student Inventory (CSI) will be used to determine the cut-score of "forcing variable" to determine placement into either the intervention or comparison group. The Thriving Quotient (TQ) and the Emotional Quotient (EQ-I) inventories will also be administered but the EQ-I will only be given as a pre-test measure. Both these measures, along with the CSI will be used for enhanced advising of the intervention group. Outcome measures will be obtained from school records at the end of each term and include:

- maintain continuous enrollment in their major
- maintain continuous enrollment in the University for two years
- persistence to their Jr. year.
- Cumulative GPA
- Number of credit hours within 2 years of initial participation.

Implementation Challenges

Alignment of government fiscal year, with our academic calendar – a general challenge relates to the grant budget, and the difference between the Federal fiscal calendar (October 1 – September 30), and our academic year calendar (August – June). This misalignment means that we anticipate carry-over funds that will be reflected in the budgets for the remaining years of the project. For example, we annually budgeted the costs for pre- and post-test student surveys. However, the pre-tests were administered during the months of May-August (Year 1) in preparation for the fall 2016 semester. On the other hand, the post-tests will be administered in March 2017, during mid-term of the spring semester (Year 2). Therefore, we anticipate requesting a no-cost extension in year 5.

Enrollment management for the aligned courses – assuring that we had enough seats and aligned courses sections offered to accommodate the 367 students in the intervention group. The project co-director worked closely with the Registrar and department chairs to reconcile all class placement issues.

Project personnel changes - two of the original project team members stepped down from the project. Dr. Linda Seiter who was initially slated to work on the predicted analytics component of our early alert advising decided the project was not a good fit for her background in computer science. Dr. Wilmina Marget, the initial project statistician also elected to step down due to her teaching load, and need to focus on tenure. In order to have a strong and applied statistician on the project, Dr. Tina Facca-Meiss agreed to join the project, and contribute time and effort during the summer (CV is uploaded). She will be responsible for mining the comprehensive data we collect, and assisting with the more complex analytical processes.

Recruitment and hiring of Project Coordinator – we received more than 30 applications for this position, with most of the applicants holding advanced degrees. Initially, we did not anticipate such a highly qualified applicant pool, and were pleasantly surprised by the backgrounds of our finalists, each of whom had significant research and project coordination experiences. Dr. Beth Rosenthal was selected (CV is uploaded) from a very competitive pool of three finalists, each of who sought compensation above what was proposed in the budget. We were able to offer competitive compensation for the 20hours/week position by reallocating funds from the initial salary budget for Dr. Wilmina Marget.

Technical Assistance - for the first several months of the project, we had concerns about receiving more advanced feedback on regression discontinuity design and its related functions, such as using a Stanine scale, and the requirements around the cut-point, baseline equivalence in an RDD model, bandwidth selection, and other matters. However, our new program officer, Stacey A. Slijepcevic, Ph.D, has helped to resolve these issues through her proactive approach. Stacey first reached out to have a telephone conversation to explore the progress of our project. After learning of our concerns, she organized a teleconference with several members of the Technical Assistance team that discussed our concerns in great detail, and offered several robust recommendations that we have, or plan to implement.

Consolidation of data from multi platforms and sources - to construct one data file from which we could analyze all study measures, it was necessary to merge enrollment data from Excel files, with data obtained from the three independent surveys. This was accomplished using a match-merge function in SPSS version 23, for which each of the separate files had to be sorted on a common key (Student ID), with an index such that each record from the individual files would be properly matched. After several failed attempts to properly merge the files, we eventually were able to complete this task, and confirm the proper alignment across records in the file to assure the integrity of the consolidated file.

Differences in methods for calculating high school GPA – A major challenge was understanding the complexity of how high school GPA's are weighted and calculated. The John Carroll University class of 2020 come from 324 different high schools, with various methods for weighing GPA, considering factors such as whether a student took AP or Dual Enrollment courses, strength of the courses taken, or the scale for which GPA's are calculated. For example, some schools will only delineate that 90-100 is A, then B, C with no +/- distinctions. Other schools will break down 100-point scales with +/-. We note that the mean GPA's reported herein are conflated with weighted and un-weighted scores as reported by the high schools. An ongoing discussion is how we might effectively transpose these diverse high school GPA calculations into a standardized 4.0 scale.

Coordination of effort – Unlike a discipline-specific research project for which typically, most aspects of the research are under the control of a principal investigator and his/her project team, the FITW project spans institutional units, including admission and enrollment, advising, academic departments, registrar, student engagement, information technology, and institutional effectiveness. Consequently, the goals and timelines for the FITW project must be synchronized to the priorities and schedules of these various entities.

Thus far, we are pleased the project has not been delayed. However, there also is the realization that every project activity cannot be achieved with the swiftness we envisioned in our proposal. For example, development of the predictive analytics "early alert" system involves significant effort in requirement gathering and analysis, design, implementation or coding, testing, and deployment, which may take as much as one-year to launch. It is not unreasonable to envision that this capability may not be in place before year 3 of the grant. We are moving forward this fall with preliminary discussions to develop next steps.

Another example is the utilization of a "student response system," to enhance the teaching/learning experience. Despite the benefits of this technology, and its importance to our project, we recognize the need to work in collaboration with I/T, instructional design, and the Center for Teaching and Learning to train faculty on its use, and assure compatibility with our primary Learning Management System, Canvas. As in the case of our commitment to develop a predictive analytics, "early alert" system, it also is not unreasonable to envision that this capability many not be in place before year 3 of the grant. We have initiated conversations with the units that will support this technology.

Process Evaluation

The external evaluator performed a Process Evaluation using a structured interview of the faculty and staff to assess program progress, impact on their departments, and state of the

collaboration. This data is presented in aggregate to maintain the anonymity of interviewees.

A. Logistical Issues: As part of the structured interview, faculty/staff were asked a number of questions which relate to the logistical issues with the overall program.

- None of the faculty/staff reported that their teaching load or other responsibilities affected their ability to perform the project.

- Approximately half of the faculty/staff reported that the time that they committed to the project was in line with what they anticipated while the other half reported that the time was either somewhat more time than expected, or much more time than expected. In general, the individuals outside of the project team were more likely to report that it took more time than expected.

- Additional funding would be useful for the following: increased travel funds to attend conferences, consultants for professional development, literature on student learning, providing stipends to part-time faculty for extra effort, higher salary for project coordinator, and enhance student services through support of care team, counseling center, and tutoring.

- Some faculty suggested that information should be shared more broadly within the JCU community including a more concise articulation of the program goals and objects. Broader communication may be helpful.

- Some faculty have suggested that having more time to make plans for implementation would be helpful.

- Consideration should be given to ensure that non-tenured faculty members are not overburdened with multiple linkages

B. Challenges

1. Communication: The following challenges are generally related to challenges with communication.

- Some faculty reported that it was challenging to identify the "go-to" person within the university for a number of issues related to the project. This has been resolved.

- Several individuals reported that it was initially challenging to communicate the goals and needs of the project to other faculty and administration at the University. They reported that it took time to both explain what the project involved and to correct misconceptions about the project. They also reported that this has been resolved and that there is buy-in and support from both the administration and other faculty.

- Some faculty/staff reported that it was challenging to get information that they needed concerning the student athletes' schedules so that they could accomplish

proper scheduling and group assignment. This has been resolved and the schedules were finalized.

- "Did not anticipate that faculty would have concerns or interest in the project. When we first rolled it out we used linked courses and that was confusing language due to the new integrated core courses and so we came up with the notion of aligned learning to distinguish this from the new core. "

- Even though students will not be told that there are different groups, they will likely determine this when they talk to each other and find out that the course sections differ.

2. Course Alignment: The following challenges are generally related to challenges with course alignment.

- Some faculty reported that faculty were originally anxious about how they could align their courses but they were successful in finding mechanisms to do so.

- Some faculty reported that the alignments may be less robust in some instances due to the logistics involved with planning the alignments and due to the truncated timeline for assigning faculty to courses. They reported that it would be helpful to give the faculty the opportunity to provide input into the schedules and alignments especially in cases where there is a 2:1 alignment.

- There was some concern with including a course that had not been typically taken by freshmen in the past due to its heavy writing demands and concern that students enter unprepared to write. This has been resolved by providing scaffolding.

- "The biggest challenge was finding faculty who wanted to participate (in aligning the courses) because of the part-timers. They couldn't give us a schedule of who was in what class and some (part-time faculty) left because they found a more permanent job. This created a problem because they were working in partners and some people then felt orphaned. We helped them to do similar linkages."

C. Positive Outcomes

- Faculty reported that the part-time faculty have become integrated into the life of the University.

- It was not initially clear as to the extent of the reach of the project and the ways it influenced enrollment management, block registration and new student orientation.

- During year 1, partners were identified in academic advising, student affairs and the registrar's office. Partners on the project have extended well beyond what was written into the grant and the project has effectively been institutionalized in year 1.

- The vast majority of the faculty/staff rated the success of the program as either very or somewhat successful. Reasons given for this rating include:

    - Created positive relationships among the people working on the project
    - Increased collaboration
    - Provided venue for engagement of part-time faculty
    - Serves as a good model for providing professional development to the part-time faculty
    - Increased faculty engagement in developing mechanisms to support students
    - Infrastructure changes have already occurred
    - Faculty are having important conversations about student thriving and about how to support freshmen to be successful
    - The project forced them to address logistical challenges needed to address 4 year planning and student assignments
    - JCU now has more information about the entering freshmen than they ever have which will allow support to be proactive rather than reactive.
    - The data from the project will allow students to be identified upon admission and does not rely on faculty reporting that students are in need of support.
    - The linked learning concept at JCU has been introduced earlier in the students' academic experience

All of the faculty/staff reported that the trajectory of the program was moving in the right direction with the vast majority reporting that it was definitely moving in the right direction. Reasons given for this include:

- The PI has been good at framing the importance of the project to the community and how it will impact the students
- The team has been successful in working together
- The administrative issues/kinks have been resolved
- The project is coming together
- Faculty are excited about how alignment works
- Students will get a better experience through course alignment
- The project focused attention on what is non-negotiable for what freshmen are to register for to ensure that the core of their schedule is solid for their degree and their success
- The development of the FAQ sheet for faculty helped to clarify the project for faculty outside of the project
- Some faculty were unsure of what they were doing at the beginning but they are now happy and excited to be coming up with new ideas
- The registration process has been greatly improved and the block schedule has been implemented
- The project is on target to implement aligned courses in the fall
- This project will help focus on student thriving rather than just student retention and focus on the "care of the whole person" which is an important aspect of the mission at JCU

D. Collaborations

All of the faculty/staff reported that they found working in a group with their John Carroll University colleagues to be useful. The vast majority reported that it was extremely useful.

The vast majority of the faculty/staff reported that the project enhanced (either greatly or somewhat) their personal interdepartmental collaborations as well as inter-departmental collaborations in general. They were much less likely to report similar effects on intra-departmental collaborations with approximately half of the respondents reporting no effect.
A number of benefits to the collaborations were noted:

- Working with individuals that they would not have
- By having conversations with other areas within the University about problems that students encounter they were better able to consider the project as part of the "big picture" in ways that they had not previously done as an academic.
- As faculty (in the aligned courses workshop) talked more with each other they had a chance to understand each other and their courses and developed better ways to work together.

E. Planning
As part of the structured interview, faculty/staff were asked a number of questions which relate to planning.

- Most of the faculty/staff have considered avenues for dissemination including specific meetings that would be relevant for dissemination of specific outcomes such as thriving of business students or thriving of women and minorities in STEM.

- Plans are in place to make the faculty workshop next year more focused on teaching strategies.

- Discussion is ongoing on how the data will be shared with the community including outcome data and data from the instruments that will be important to mentoring/advising the students.

- Discussion is ongoing on how to improve the recruitment of diverse students.

- There was some concern for how the service-learning component will be implemented.

- Planning is underway to develop training on advisement.

F. Changes
As part of the structured interview, faculty/staff were asked a number of questions which relate to changes.

- There have been some changes in personnel including the statistician but these changes have not impacted the timeline.

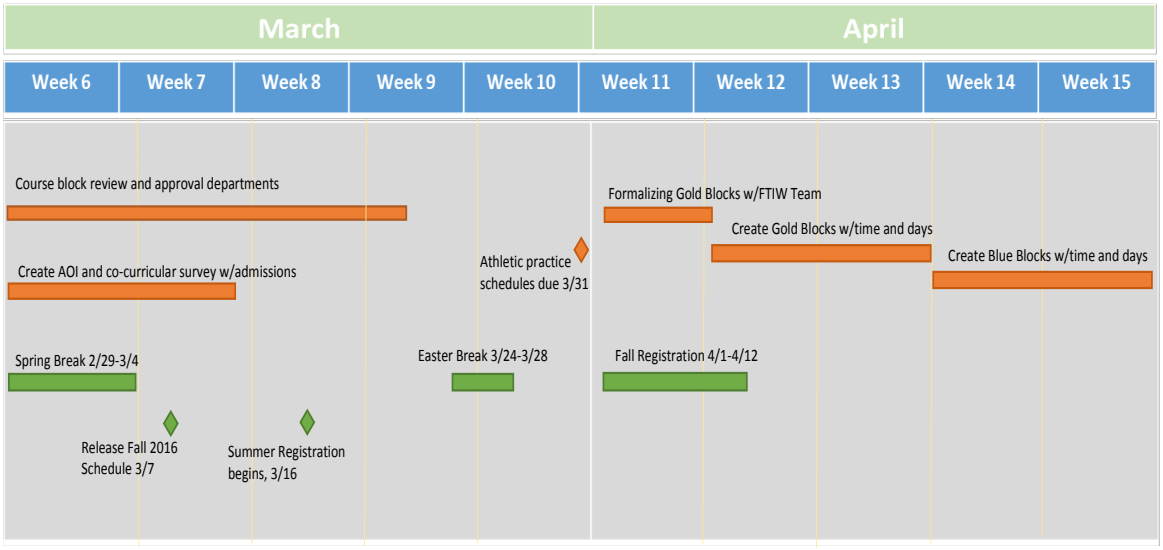
- Since approximately one-third of the students take the introduction to economics class, this was developed as a linked class.

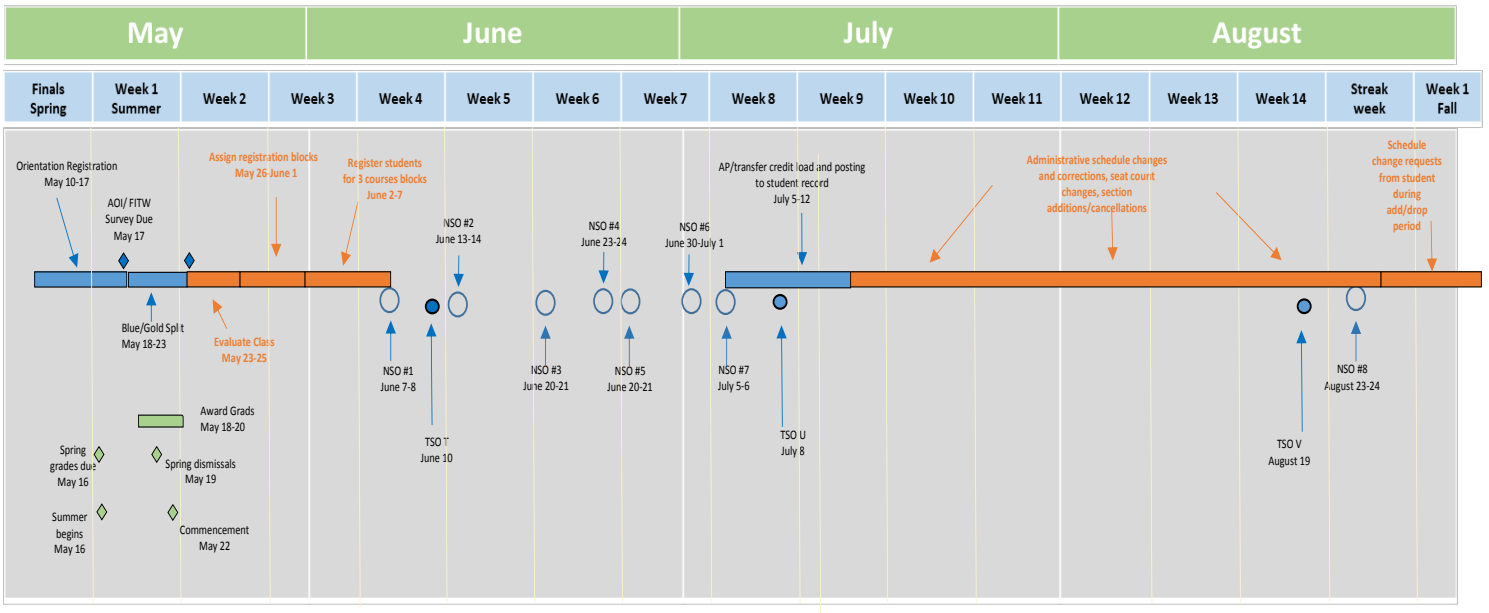
- The Emotional Intelligence scale will only be given as a pre-test based on the certification training.

Figure 1 – FITW Student Scheduling Timeline (March – August)

Figure 1 depicts the timeline and activities associated with review and approval of blocked courses, and other activities associated with scheduling courses for fall 2016. References to the "Gold group" reflect activities associated with the intervention group. References to the "Blue group" represent activities associated with the comparison group.

FITW Student Scheduling Timeline (March – August)





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