

Rio Salado College

Mobile Apps Programming Program Review

Review Period: Academic Years 2015-2017

Review Conducted: AY2017-18

I. Degrees and Certificates in the Mobile Apps Programming Program

Associate in Applied Science (AAS) in Mobile Apps Programming, Certificate of Completion (CCL) in Mobile Apps Programming, Certificate of Completion (CCL) in Programming.

AAS in Mobile Apps Programming (3139)

Total Credits: 64

Description:

The Associate in Applied Science (AAS) in Mobile Apps Programming is designed to provide information and training on the programming aspect of technology. Individuals will be provided with the opportunity to develop skills necessary to work in the programming field including mobile applications programming. The program also includes a Certificate of Completion (CCL) in Programming, a Certificate of Completion (CCL) in Programming and System Analysis, and a Certificate of Completion (CCL) in Mobile Apps Programming.

Program Notes:

Students must earn a grade of C or better for all courses within the program.

+ indicates course has prerequisites and/or corequisites.

++ indicates any module/suffixed courses.

Student will need to consult with a program advisor on availability of Certificate of Completion programs.

Program requirements for CCL/5047 or CCL/5048 may be taken in the CCL/5793 Mobile Apps Programming.

Program Prerequisites: None

Required Courses:

37-45

Certificate of Completion in Programming (5047) (21-26)

OR

Certificate of Completion in Programming and System Analysis (5048) (24)

AND		
Certificate of Completion in Mobile Apps Programming (5793) (16-45)		37-45
General Education Requirements:		19-27
General Education Core:		9-17
First-Year Composition Credits:		6
+ ENG101	First-Year Composition (3) OR	
+ ENG107	First-Year Composition for ESL (3) AND	
+ ENG102	First-Year Composition (3) OR	
+ ENG108	First-Year Composition for ESL (3)	6
Oral Communication:		3
Any approved General Education course in the Oral Communication area.		3
Critical Reading Credits:		0-3
+ CRE101	College Critical Reading and Critical Thinking (3) OR	
+ CRE111	Critical Reading for Business and Industry (3) OR	
	Equivalent as indicated by assessment.	0-3
Mathematics Credits:		0-5
Mathematics may be met by MAT120, or MAT121, or MAT122 if taken in Required Courses area.		
+ MAT120	Intermediate Algebra (5) OR	
+ MAT121	Intermediate Algebra (4) OR	
+ MAT122	Intermediate Algebra (3) OR	
	Satisfactory completion of a higher level mathematics course.	0-5
General Education Distribution:		10
Humanities, Arts and Design:		3
Any approved general education course from the Humanities, Arts and Design area.		3
Social-Behavioral Sciences:		3
Any approved general education course from the Social-Behavioral Sciences area.		3
Natural Sciences:		4

Any approved general education course from the Natural Sciences area.

4

CCL in Mobile Apps Programming (5793)

Total Credits: 16-45

Description:

The Certificate of Completion (CCL) in Mobile Apps Programming is designed to prepare individuals with the skills necessary to develop and distribute applications for mobile devices. Courses will include Mac Operating System, Adobe Photoshop, and Hypertext Markup Language (HTML)/Cascading Styles Sheets (CSS) for the development of iPhone, Android, and Windows 8 App development.

Program Notes:

The Computer Information System (CIS) courses required by this program are not applicable if taken more than eight (8) years prior to the completion of the certificate program. Consult with an Academic Advisor for complete information.

Students must earn a grade of "C" or better for all courses within the program.

+ indicates course has prerequisites and/or corequisites.

Program Prerequisites:

0-29

- + CIS150 Programming Fundamentals (3) **AND**
Certificate of Completion in Programming (5047) (21-26) **OR**
Certificate of Completion in Programming and System Analysis (5048) (24) **OR**
Permission of Department or Division Chair. 0-29

Required Courses:

16

- | | | |
|------------|---|---|
| CIS120DF | Computer Graphics: Adobe Photoshop | 3 |
| CIS121AI | Mac Operating System | 1 |
| CIS132 | HTML/CSS | 3 |
| + CIS165 | Introduction to IOS Application Development | 3 |
| + CIS165DA | Android Mobile Device Programming | 3 |
| + CIS165DB | C#/VB.NET: Windows 8 Mobile App Development | 3 |

CCL in Programming (5047)

Total Credits: 21-26

Description:

The Certificate of Completion (CCL) in Programming is designed to prepare the student to work in the programming field. Courses focus on programming theory, Java programming, Visual Basic programming, and web programming.

Program Notes:

The Computer Information System (CIS) or the Computer Science (CSC) courses required by this program are not applicable if taken more than eight (8) years prior to the completion of the certificate program. Consult with an Academic Advisor for complete information.

Students must earn a grade of "C" or better for all courses required within the program.

+ indicates course has prerequisites and/or corequisites.

++ indicates any suffixed courses.

Program Prerequisites: **0-5**

Students selecting CSC110 in the Required Courses area must complete MAT120/MAT121/MAT122.

- + MAT120 Intermediate Algebra (5) OR
- + MAT121 Intermediate Algebra (4) OR
- + MAT122 Intermediate Algebra (3) OR
Permission of Instructor 0-5

Required Courses: **21**

- CIS105 Survey of Computer Information Systems 3
- + CIS119DO Introduction to Oracle: SQL (3) **OR**
- + CIS276DA MySQL Database (3) **OR**
- + CIS276DB SQL Server Database (3) 3
- + CIS159 Visual Basic Programming I 3
- + CIS162AD C#: Level I 3
- + CIS163AA Java Programming: Level I (3) **OR**
- + CSC110 Introduction to Computer Science (Java) (3) 3
- + CIS225AB Object-Oriented Analysis and Design (3) **OR**
- + CSC205 Object Oriented Programming and Data Structures (3) 3
- + CIS259 Visual Basic Programming II (3) **OR**

+	CIS262AD	C# Level II (3) OR	
+	CIS263AA	Java Programming: Level II (3)	3

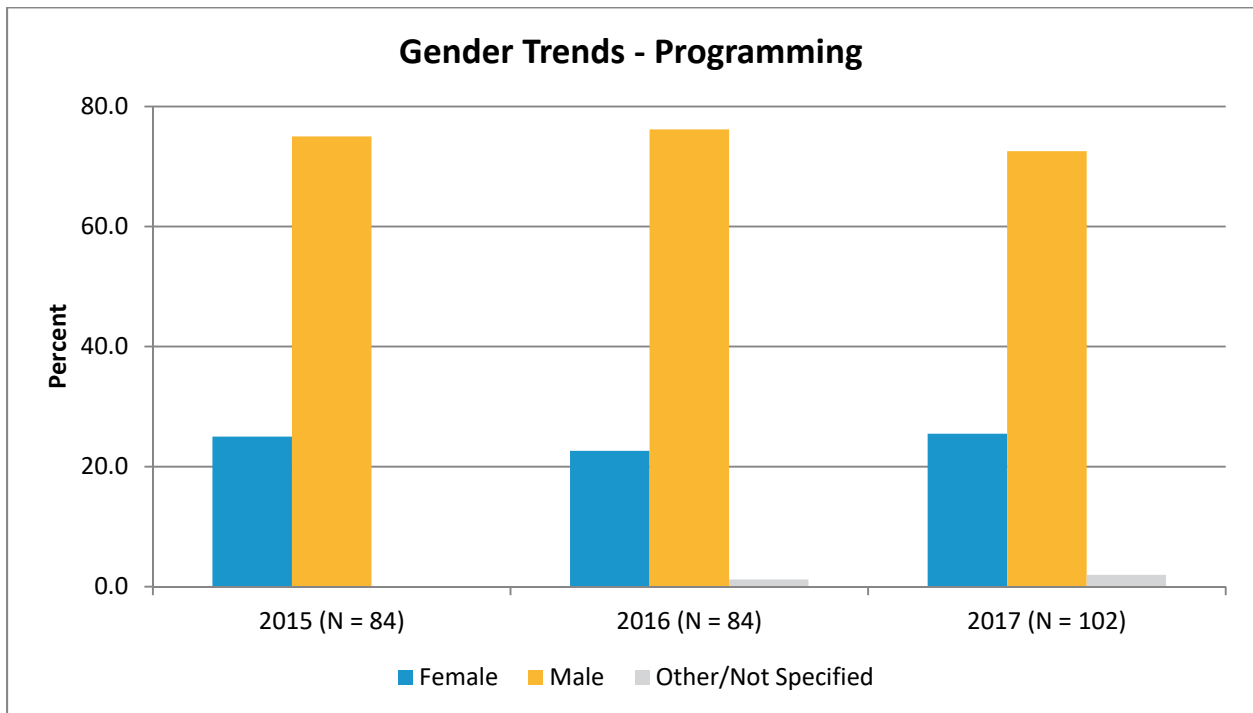
II. Program Purpose and Mission

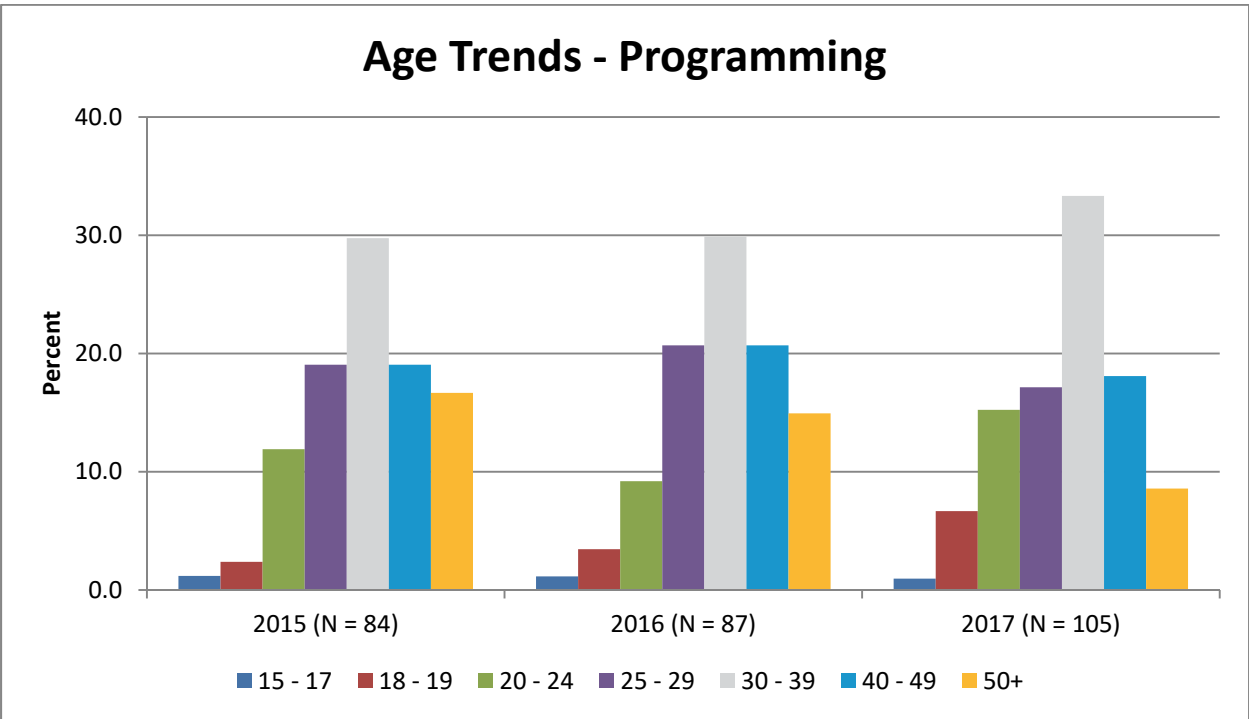
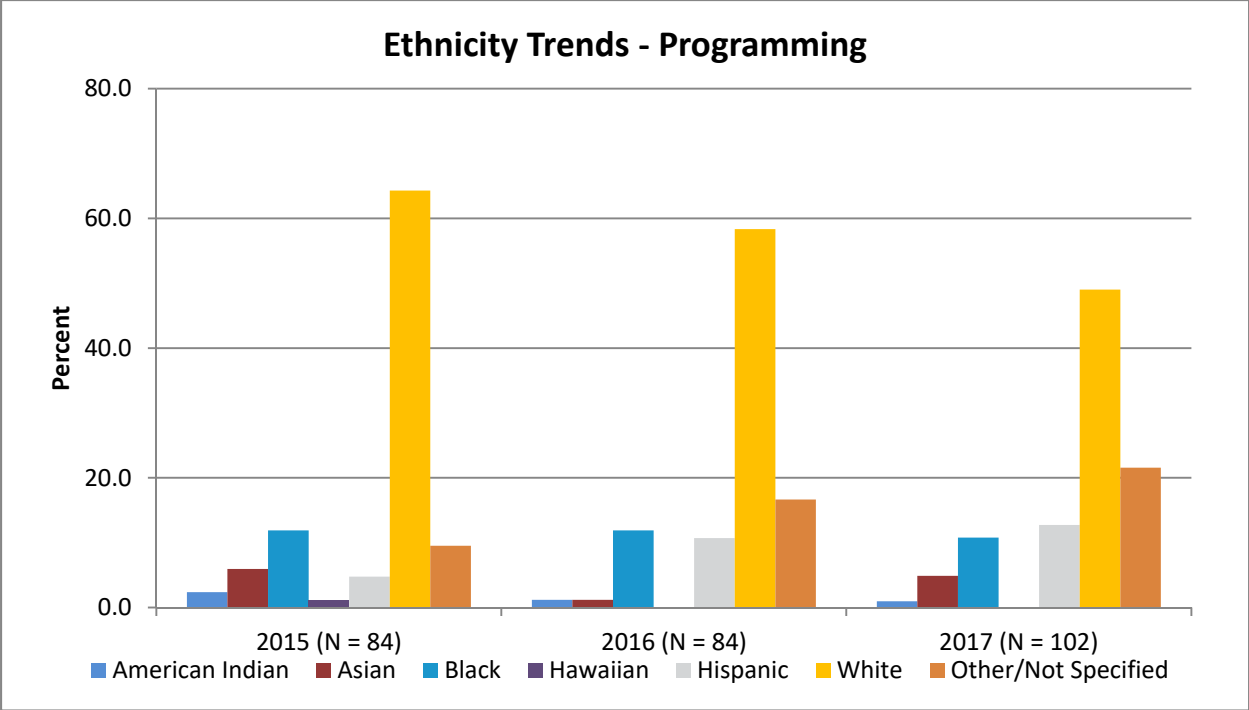
The Mission of the Mobile Apps Development AAS and CCL programs at Rio Salado College is to prepare students for employment through high-quality, flexible, and innovative classes in coding, programming, and mobile application development on a wide variety of platforms. Graduates will be proficient in iOS (iPhone/iPad), Android, and Windows 10 devices, as well as the Mac Operating system and some basic graphic skills with Photoshop.

The Mobile Apps mission statement directly supports the College’s Mission to “transform the learning experience through: ...Customized, high-quality courses and programs; and ...Flexibility, affordability, and innovation”. The STEM Department relentlessly improves the curriculum with regular course development to stay current.

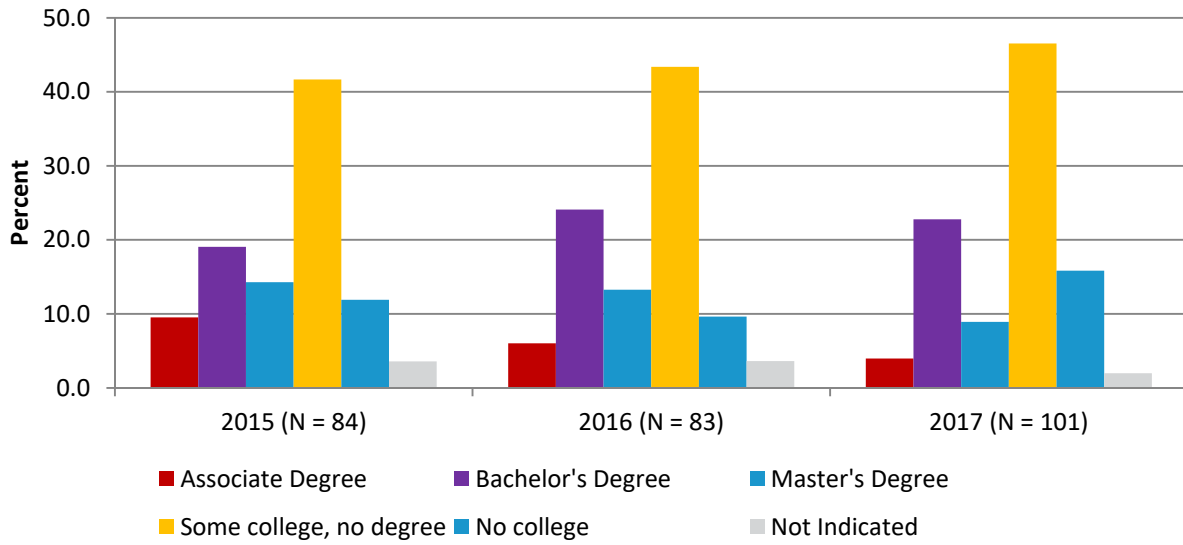
III. Student Population of the Mobile Apps Development Program

a. Student Data Analysis

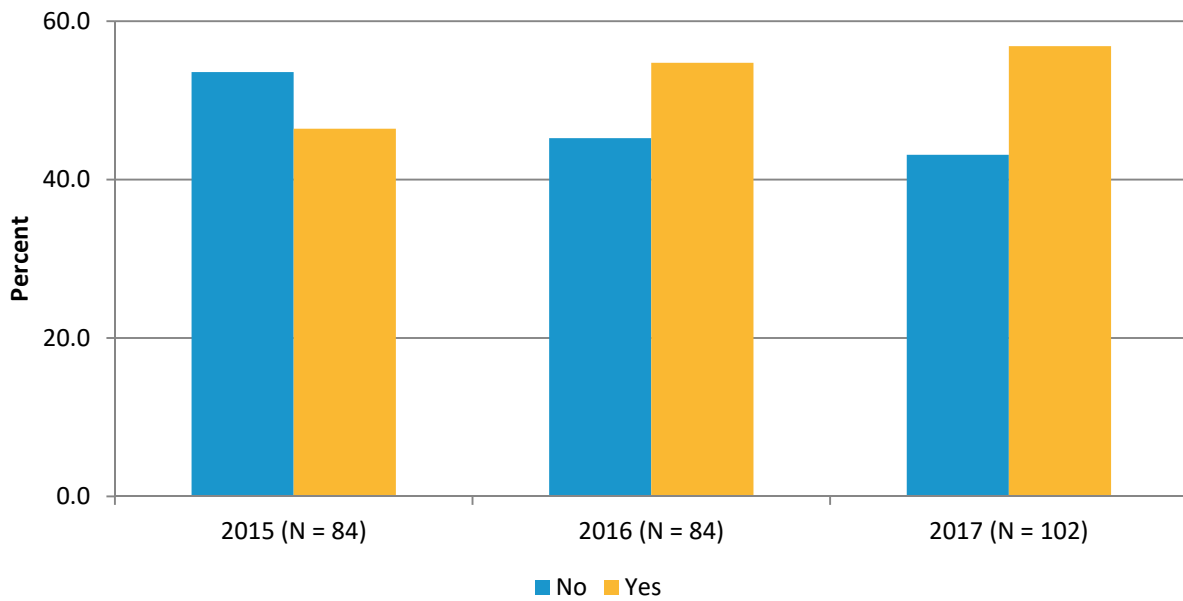




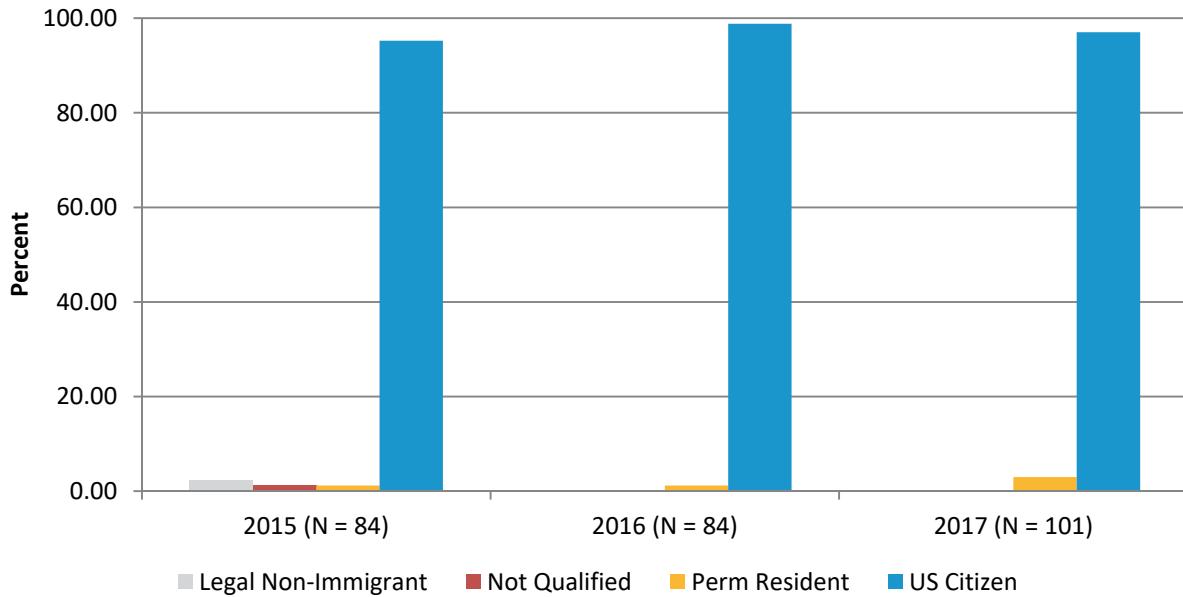
Previous College Experience Trends - Programming



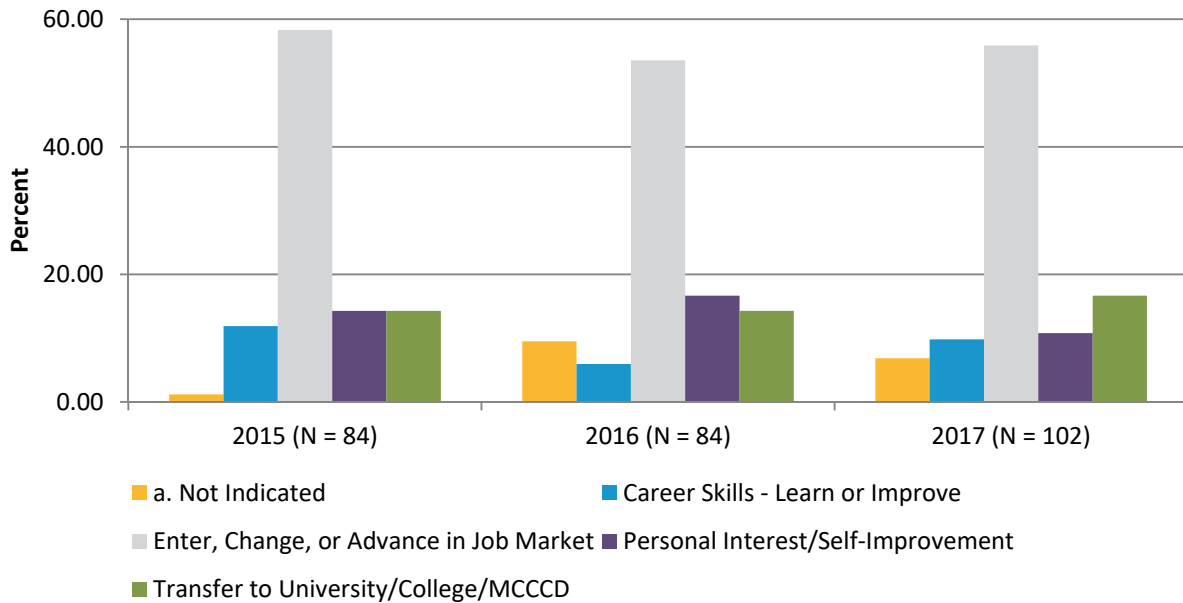
First Generation Trends - Programming



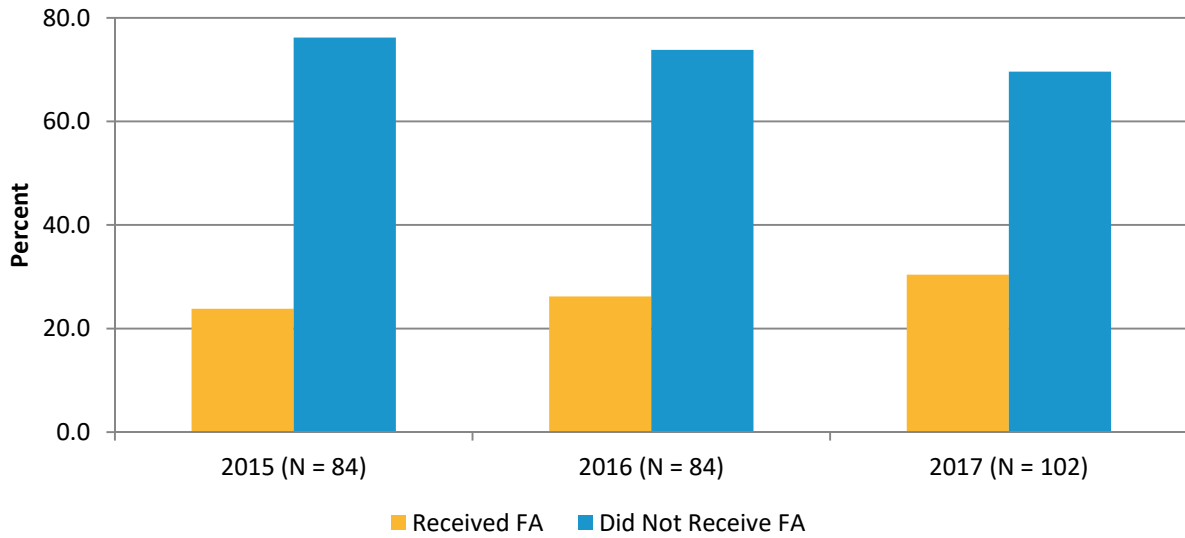
Citizenship Trends - Programming



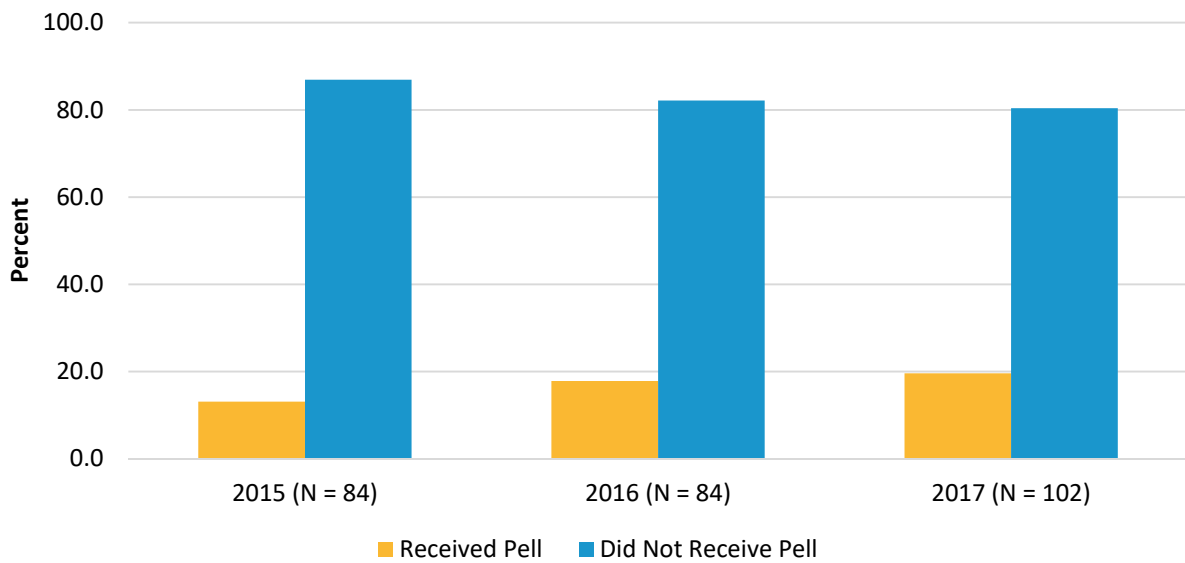
Current Intent Trends - Programming



Students Receiving Financial Aid Trends - Programming



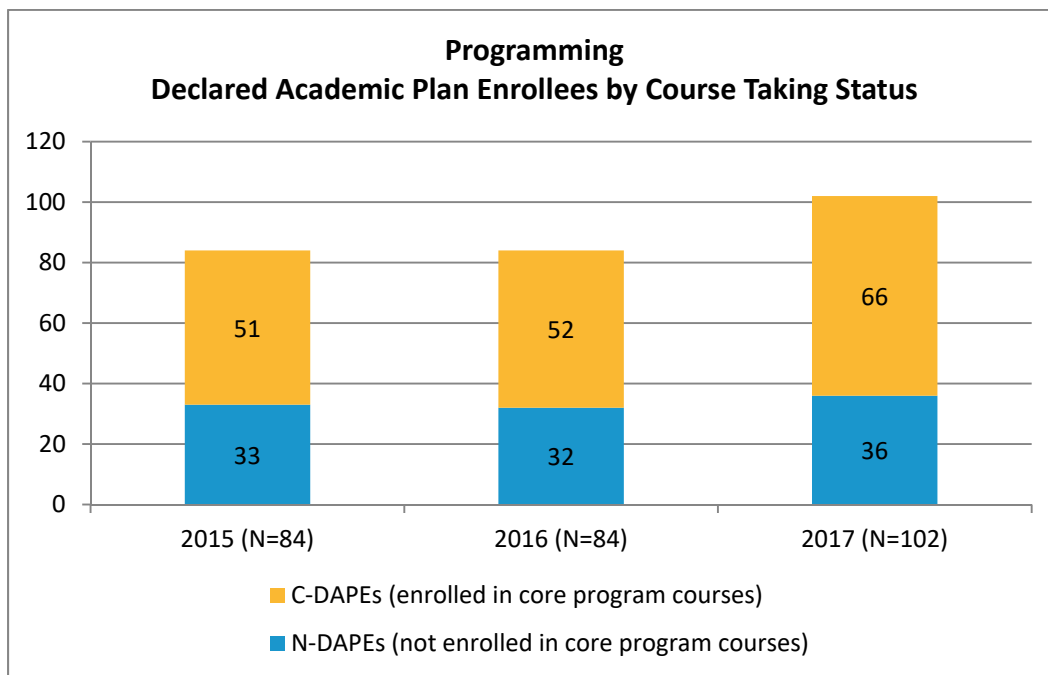
Students Receiving Pell Trends - Programming



It is not surprising to see that we currently serve a mostly white, male population seeking to enter, change, or advance in the job market. However, the program would like to appeal to more underserved, racial and ethnic minority, and female populations through partnerships and community outreach efforts. For example, the Girls Have I.T. Day at Xavier College preparatory encourages diverse young women from all regional schools to explore career pathways in coding. The STEM department also participates in STEM career fairs at Connolly Middle School, Laveen School District, and in Tempe during “Geeks Night Out”.

b. Enrollment Trends

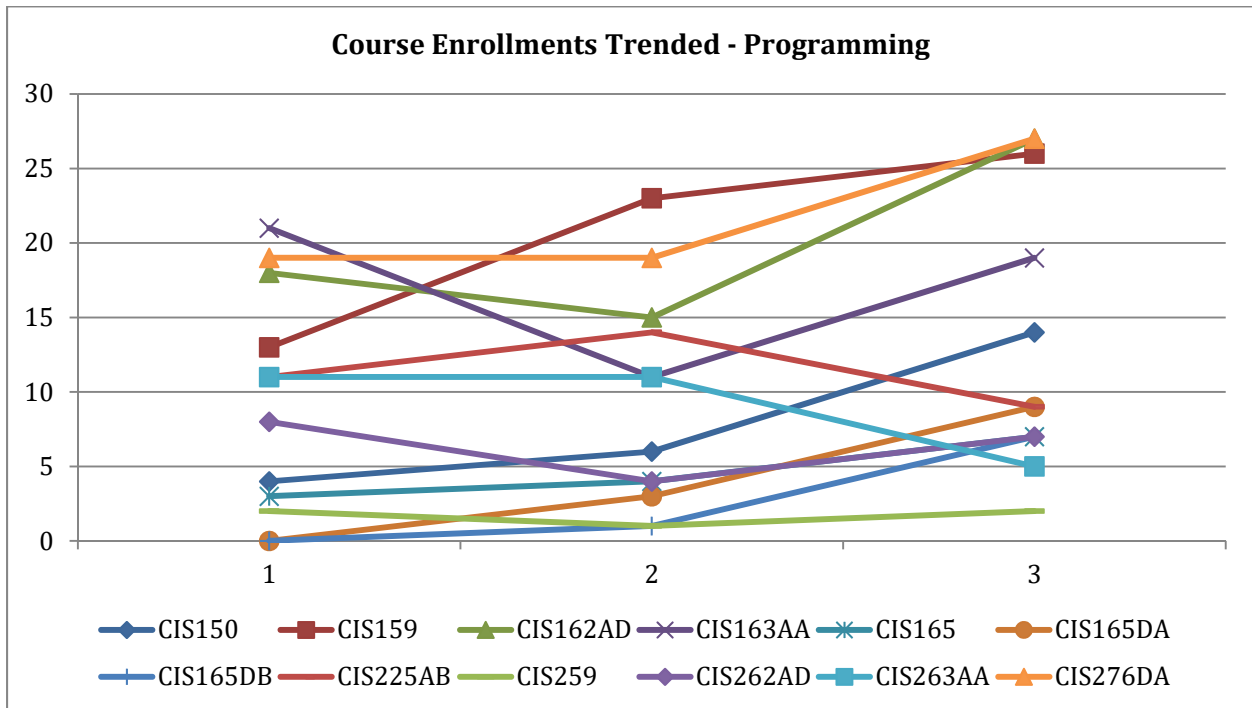
Table 1. FTSE by Year - Programming			
	2015	2016	2017
C-DAPes (Declared Academic Plan /Enrolled in Core Program Courses)	8.2	10.9	14.3



The program is slowly growing even during these years of overall College enrollment decline. A factor to be considered is that the last class to be developed in the program was not until 2017. So although students could enroll, they had to take or get a waiver for one class in particular up until that time. In addition, another course is cross-listed at Rio and not at the sharing Colleges.

Table 2. Top Course Enrollments Trended - Programming			
Course	2015	2016	2017
CIS150-IN	4	6	14
CIS159-IN	13	23	26
CIS162AD-IN	18	15	27
CIS163AA-IN	21	11	19
CIS165-IN	3	4	7
CIS165DA-IN	0	3	9
CIS165DB-IN	0	1	7
CIS225AB-IN	11	14	9
CIS259-IN	2	1	2
CIS262AD-IN	8	4	7
CIS263AA-IN	11	11	5
CIS276DA-IN	19	19	27
Total-	110	112	159

Note: Top 5 courses by highest enrollment count each year are highlighted in yellow.



CIS276DA was a pleasant surprise. While the mobile apps classes CIS165DA and CIS165DB continue to disappoint, it is important to remember that the classes are new and students progressing through the degree pathway would just now be completing the prerequisites.

c. Student Graduation Data

Table 3. Cohort Graduation Rates and % of Graduates Receiving Financial Aid - Programming CCL (5047)						FY When Award Conferred		
						2015	2016	2017
Total Graduates¹						17	12	7
FY Cohorts²	Cohort (N)	Conferred Award (N)	% Conferred Award	% Graduates Financial Aid³				
2015	28	11	39.3%	45.5%	2	7	2	
2016	28	6	21.4%	50.0%	1	2	3	
2017	18	2	11.1%	50.0%	1	0	1	

Reports the total number of graduates without cohort classification constraints.

Cohort created based on first FY that student declared the academic plan. Cohort created to compute approximate graduation rates; however, for programs with small numbers (Cohort <50), rates are subject to high degrees of variability and should not be used for making inferences. Cohorts will not be identical in size to those created for persistence, which is based on term with summer terms modified.³If students received any financial aid during their enrollment in the program, they are counted as Graduates with Financial Aid.

Note: IR did not provide data on Mobile Apps CCL (5793) or AAS (3931) as programs have not yet produced completions.

There was one student listed in the program for 2018 graduation. Since the program is now complete, the College can expect increased completions in the terms to come.

IV. Student Goals and Satisfaction

a. Goals

As seen by declared intent, most students have a goal of career advancement. The College has not yet produced enough graduates to determine if the goal is being met.

b. Satisfaction

In-Person Questions

1. My instructor was prepared for each class meeting.
2. My instructor communicated the course policies and procedures.
3. My instructor answered my questions about the course content.
4. My instructor kept me informed about my progress in the course.
5. My instructor presented objectives for each lesson.
6. The assignments were based on what I was expected to learn.
7. My assignment feedback explained why I earned or lost points.
8. My instructor's feedback on assignments helped to increase my understanding of the course content.
9. My instructor created an effective learning experience.

Table 4. In-Person End-of-Course Evaluation Data										
									Number of Surveys	221
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	
CIS159	4.55	4.64	4.68	4.27	4.59	4.64	3.95	4.05	4.27	
CIS163AA	3.86	4.03	4.06	3.97	4.10	4.07	3.83	3.61	3.68	
Total	3.93	4.09	4.12	4.00	4.15	4.13	3.84	3.65	3.74	

Distance Questions

1. My instructor communicated the course policies and procedures.
2. My instructor communicated his/her expected response time for messages and grading assignments.
3. My instructor responded to messages within the stated time frame.
4. My instructor graded assignments within the stated timeframe.
5. My assignment feedback explained why I earned or lost points.
6. My instructor's feedback on assignments helped to increase my understanding of the course content.
7. My instructor provided complete responses to my questions.

Table 5. Distance End-of-Course Evaluation Data								
							Number of Surveys	256
Course	Q1	Q2	Q3	Q4	Q5	Q6	Q7	
CIS150	4.50	4.40	4.21	4.40	4.28	4.17	4.30	
CIS159	4.66	4.61	4.59	4.72	4.55	4.11	4.14	
CIS162AD	4.57	4.47	4.56	4.68	4.47	4.08	4.08	
CIS163AA	4.44	4.43	4.47	4.63	4.39	4.02	4.12	
CIS165	4.40	4.40	3.60	3.80	4.60	3.00	3.40	
CIS165DA	4.00	3.88	3.13	3.38	3.50	3.25	2.88	
CIS165DB	4.00	4.00	4.00	4.00	4.00	3.00	3.00	
CIS225AB	4.57	4.54	4.50	4.50	4.57	4.36	4.50	
CIS259	4.75	4.75	4.75	4.75	4.75	4.75	4.00	
CIS262AD	4.29	4.21	4.21	4.29	4.36	4.29	4.43	

CIS263AA	4.28	4.08	4.00	4.32	4.20	3.91	3.96
CIS276DA	4.46	4.60	4.60	4.69	4.58	4.48	4.65
Total	4.46	4.41	4.36	4.51	4.40	4.08	4.14

Often, the Mobile Apps degree and certificates at Rio Salado College serve students in programming degrees at other colleges. Overall, students report satisfaction with the courses, with two notable exceptions: CIS165 and CIS165DA. Both courses are undergoing significant redevelopment to become less dependent on texts for rapidly changing technology.

The only score that fell below 3.0 was Q7 in the CIS165DA course. With a small sample size (n=8) and a brand new course, it is not yet clear if there is an issue for improvement in the responsiveness of the instructor or if during the initial terms there were questions due to the pilot nature of the course. There are often a few errors in course materials in the first couple of terms. The recommendation is to continue to monitor the Q7 indicator and not act on it at this time.

V. Evaluation of Curriculum

The program came about originally as part of the NISGCT DOL TAACCCT Grant discussions. At the time, direction came from the national business and industry leadership team (BILT) through the grant director, a subject matter representative from South Mountain Community College, and the NISGTC Principal Investigator representing the IT industry. The grant eventually chose not to support the Mobile Apps degree and CCL since Rio Salado would not be able to produce graduates in time to meet grant objectives. But the industry advisory board approval, knowledge, skills, and abilities (KSA) framework, program design, and curriculum “fast-track” were created by the grant team.

Subsequently, the Programming Industry Advisory Board (IAB), which existed prior to the creation of Mobile Apps, has reviewed and approved the curriculum on an annual basis. It is time, however, to separate the IAB from general Programming and create a new IAB specific to Mobile Apps programming. The chair has a number of contacts and will convene the new group in spring, 2019.

Individual Course content is updated almost every year. Here is a summary of Course development and redevelopments in the last few years:

- CIS121AI Mac Operating System – Started in 2013, developer walked away. Restarted and finished in 2017 using all OER and home-developed content.

- CIS150 – Programming Fundamentals - Last developed in 2014, currently (Summer 2018) in redevelopment for no-text. Chair is recording screencast videos to supplement developed content.
- CIS156 – Python – Not currently part of program. Course is being developed as a stand-alone, but with intention of adding it to Mobile Apps degree in the future at the request of IAB.
- CIS159 – Visual Basic – Last developed in 2015. Course is badly in need of redevelopment. Software is out of date and text is no longer available. Chair is pushing out rapid redevelopment at no cost to adopt new edition of the text (switch to e-text) and software. At the same time, we have identified a developer to do a major overhaul to Cengage with Mindtap, hopefully under a subscription model.
- CIS162AD – C# Level I – redeveloped Summer/Fall 2016
- CIS163 – Java Level I – redeveloped August 2016
- CIS259 – Visual Basic Level II – redeveloped July 2017 with no text, but likely to align this with the Cengage/Mindtap at the completion of CIS159 project.
- CIS 262AD – C# level II - redeveloped Fall/Winter 2016
- CIS263 – Java Level II - redeveloped Feb 2017
- CIS165 – Apple/iOS – originally developed in February 2014, then redeveloped again October 2016, and under redevelopment again in Summer 2018.
- CIS165DA – Android - Originally developed in Summer 2015. Chair updating to new book (2018) currently at no cost to College.
- CIS165DB – Windows 8 (XAML) - Originally developed in September 2017. Curriculum needs to be updated for Windows 10 competencies.
- CIS225AB – Object-Oriented Analysis and Design - Last developed March 2017. Replaced CIS225.
- CIS276DA – MySQL – Last developed 2015 – needs minor updates and permissions for tutoring and computer lab to install a WAMP server.

As one can see, the curriculum is constantly under revision.

VI. Student Learning Outcomes

a. Program-Level Student Learning Outcomes

Program Competencies: AAS in Mobile Apps Programming

CCL in Programming (5047)

1. Define terms related to microcomputer usage and applications. (CIS105)
2. Identify microcomputer hardware and software components. (CIS105)
3. Apply microcomputer operation skills: care and handling of diskettes, powering up the computer, keyboarding (required speed development: 25 words per minute), and powering down the computer. (CIS105)
4. Evaluate and select microcomputer hardware and software for specific applications. (CIS105)
5. Describe basic graphics, sound, process control, and other special capabilities of a microcomputer. (CIS105)
6. Use SQL programming language to interpret data in a relational database. (CIS119DO, CIS276DA, CIS276DB)
7. Describe the components and techniques of structured programming. (CIS159, CIS162AD, CIS163AA, CSC110)
8. Explain program business and structure using logic tools. (CIS159, CIS163AA, CSC110)
9. Describe advanced programming techniques. (CIS225AB, CIS259, CIS262AD, CIS263AA, CSC205)

OR

CCL in Programming and System Analysis (5048)

1. Identify common uses of computers in business and other sectors of society. (CIS105)
2. Name and explain the steps in the system development process. (CIS105)
3. Describe the components of a Management Information System. (CIS105)
4. Write simple programs in a common programming language using appropriate input, output, and processing statements for that language. (CIS105)
5. Identify and define the major components of an operating system, both hardware and software. (CIS126D+, MST150++)
6. Design algorithms for simple business problems. (CIS150++)
7. Analyze problem descriptions and design programming solutions to the problems, using common problem-solving techniques. (CIS151, CIS159, CIS162++, CIS163AA)
8. Write elementary programs in various programming languages. (CIS151, CIS159, CIS162++, CIS163AA)

9. Analyze problem descriptions and design programming solutions to the problems using common problem-solving techniques. (CIS224)
10. Describe the integrated workings of systems and subsystems within a business organization. (CIS225++, CIS250)
11. Set up, maintain, and use a database management program. (BPC/CIS217AM, CIS119DO, CIS276DA)

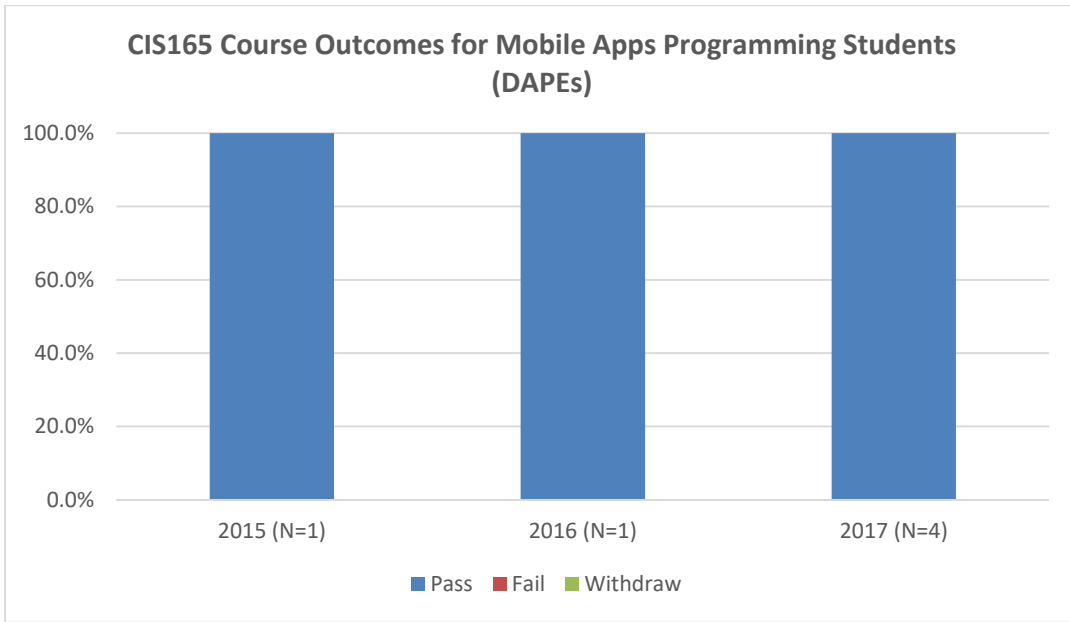
AND

CCL in Mobile Apps Programming (5793)

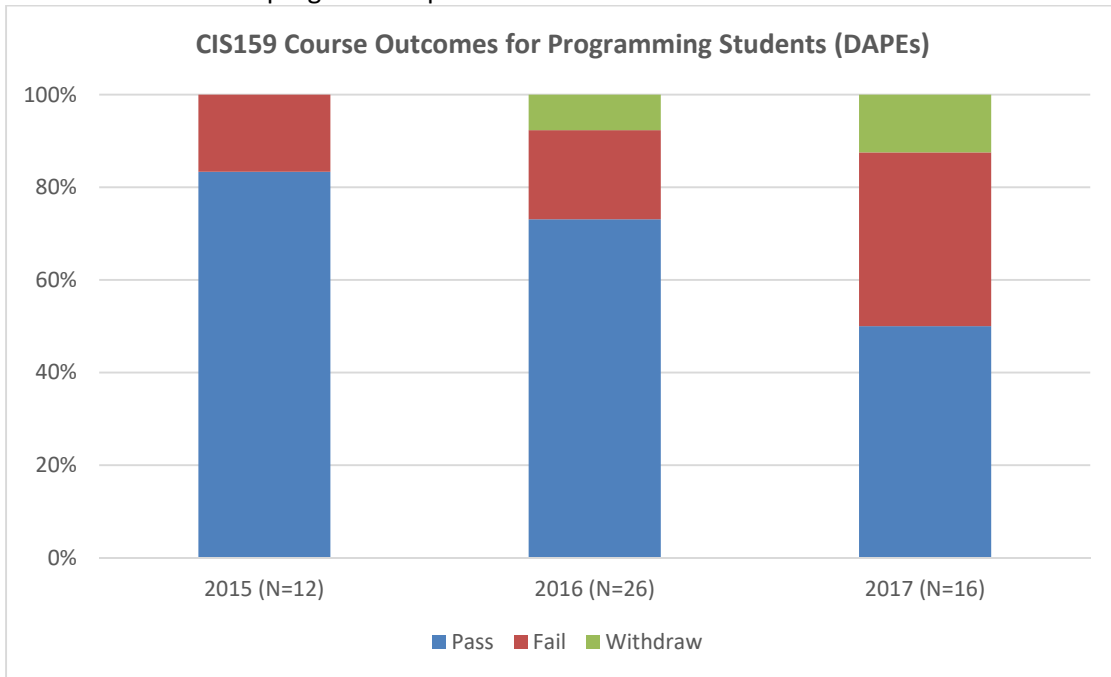
1. Create, edit, and manipulate images. (CIS120DF)
2. Demonstrate use of a Mac operating system. (CIS121AI, CIS165)
3. Use Hypertext Markup Language (HTML). (CIS132)
4. Use Cascading Style Sheets (CSS) to format webpage elements. (CIS132)
5. Develop applications for iPhone. (CIS165)
6. Describe software tools and programming techniques for developing Android device applications. (CIS165DA)
7. Develop applications for Android devices. (CIS165DA)
8. Develop applications for Windows 8 smartphones and tablets. (CIS165DB)
9. Package applications for distribution. (CIS165, CIS165DA, CIS165DB)

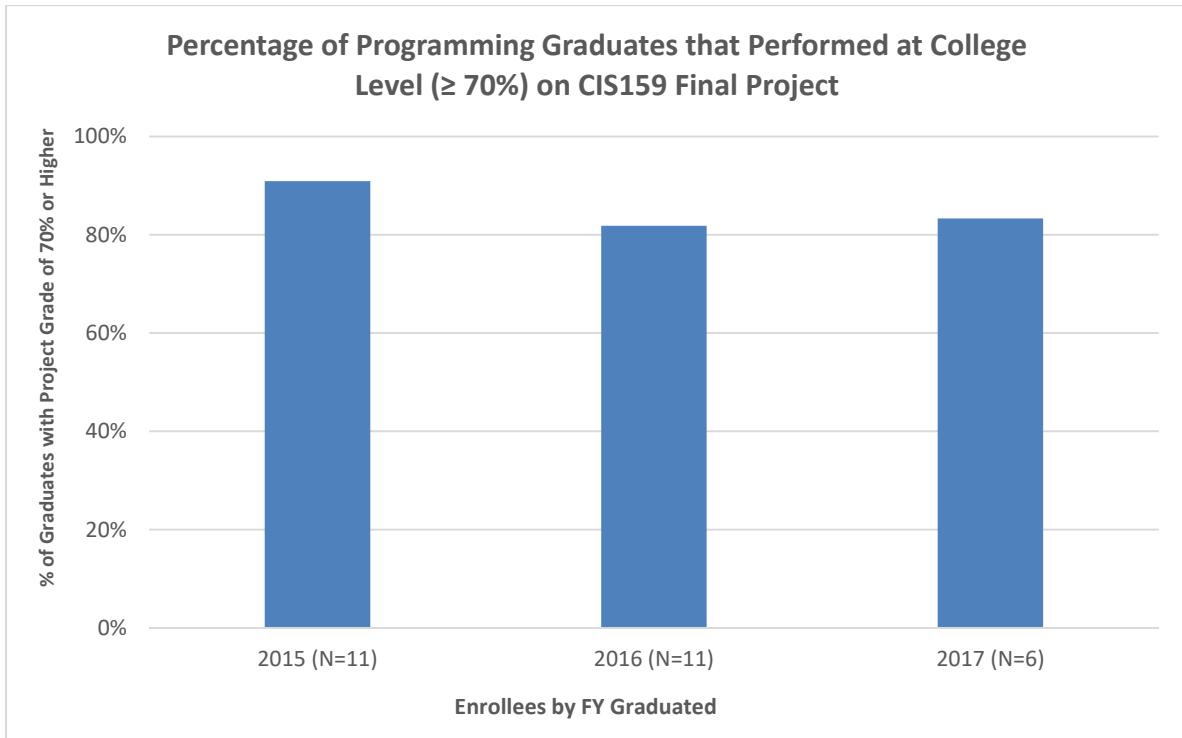
At program completion, graduates will be proficient in iOS (iPhone/iPad), Android, and Windows 10 devices, as well as the Mac Operating system and some basic graphic skills with Photoshop. Graduates will be prepared for jobs in coding, programming, and mobile application development on a wide variety of platforms.

CIS165 is the most logical benchmark course in the program to measure program-level learning outcomes. But there wasn't a lot of data to analyze for this report. So CIS159 was selected as an additional benchmark.



Note: Data for program level learning outcomes in Mobile Apps CCL (5793) and AAS (3931) are not yet available due to the lack of program completers.





100% (with a small sample size) of students in CIS165 are meeting course and program objectives in CIS165. CIS159, however, paints a different picture. Although the majority of students pass the objectives – both College-wide Learning Outcomes and department/program Course objectives, it is interesting to see that more students fail than choose to withdraw. One possible explanation is that the students fall behind and stay in the course hoping to “catch-up,” then fail when they pass the withdraw deadline. Following the PDCA cycle, it is recommended that the STEM department attempts additional roster management and outreach efforts to support success. Efforts should include encouragement for students to withdraw when they are falling behind and are not likely to get caught up.

b. College-Wide Student Learning Outcomes

In addition to the program-level outcomes addressed above, all Rio Salado College students must know and be able to do the following:

1. **Critical Thinking:** The student will demonstrate the ability to analyze information, evaluate material, use inference to draw conclusions, and use deductive reasoning and inductive reasoning at a college level
2. **Information Literacy:** The student will demonstrate the ability to determine an information need, access successfully and evaluate critically the needed information, and organize and apply the information appropriately to accomplish a given research task.
3. **Oral Communication:** The student will demonstrate the ability to prepare and present oral communication in a variety of contexts as a college-level speaker.

4. **Reading:** The student will demonstrate the ability to comprehend a variety of materials by determining the central idea and providing textual evidence, drawing inferences or valid conclusions, analyzing the author’s purpose and bias, and applying the text to a given task or course content.
5. **Writing:** On a written assignment, the student will demonstrate the ability to generate relevant and sufficient content; organize his or her thoughts coherently; adhere to the conventions of correct mechanics and sentence structure; and use correct terminology and rich vocabulary in the fulfillment, at the college level, of his or her writing assignments.

For more information: <http://www.riosalado.edu/about/teaching-learning/assessment/Pages/SLO.aspx>

Course	Critical Thinking Flag	Reading Flag	Info Lit Flag	Oral Comm Flag	Writing Flag
CIS150		Y	Y		Y
CIS159		Y	Y		Y
CIS162AD		Y	Y		Y
CIS163AA		Y	Y		Y
CIS165		Y	Y		Y
CIS165DA		Y	Y		Y
CIS225AB		Y	Y		Y
CIS259	Y	Y	Y		Y
CIS262AD		Y	Y		Y
CIS263AA		Y	Y		Y
CIS276DA		Y	Y		Y

The program offers specific training for new adjuncts in the implementation of the college-wide student learning outcomes. Courses were realigned a couple of years ago with the insertion of Reading. This was done initially without the Chair’s knowledge, so it is unclear exactly how or if the adjunct faculty members know that their scoring dimension is being collected as part of the reading SLO. At the Fall 2018 All Faculty Meeting, the Chair and lead faculty will discuss Reading outcomes specifically to ensure adjuncts are evaluating the dimensions appropriately.

Overall, more than 80% of students are performing at or above College level in all of the College-Wide Learning Outcome areas:

Overall: 86%

- Critical Thinking 83%
- Information Literacy 84%
- Oral Communication: N/A
- Reading: 84%
- Writing: 84%

However, a deeper inspection shows many individual assignments within Mobile Apps programming courses with below standard performance rates. It is suggested that the program implement RioLogs to examine the assignments in more detail to diagnose the anomalies. CIS165 in particular is very low in several areas, but it is a very small sample size and the course has been redeveloped three times in the last 5 years.

Information literacy is non-standard in these courses. The students are not conducting usual research. Rather, they need to use appropriate tools to find and implement code samples and to check that their code sample is commented appropriately so as not to be directly plagiarized. In CSI59, they students do a lot of critical thinking and finding information on their own. This has created a little bit of a stir as the students are acclimated to getting shown everything in their other coding classes. A suggestion for the future (potential RioLog project) is to incorporate critical thinking and information literacy standards more deliberately into the level one programming classes CIS159, CIS162AD, and CIS163.

VII. Effective Teaching

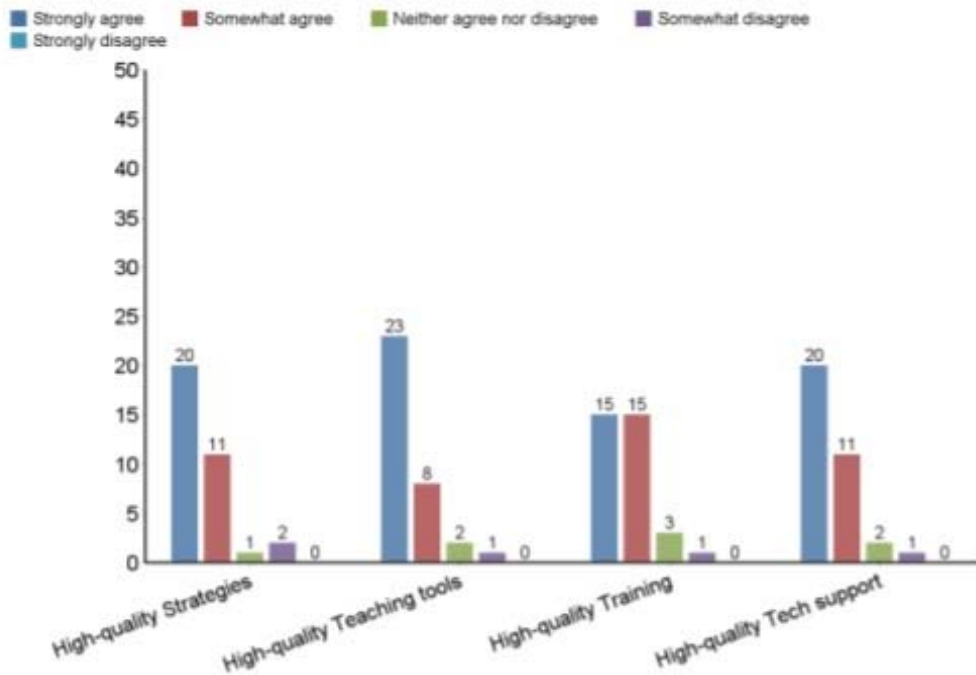
The STEM faculty meet twice a year during the All-Faculty meetings for breakout and training on effective teaching strategies. All new faculty are required to complete AFD101 and are strongly encouraged to complete additional AFD courses. Faculty are invited to professional conferences, mostly regionally, but occasionally on the national level. For example, the lead faculty (at the time) participated in nanotechnology training at Penn State and again at ASU.

Data from the annual faculty survey were not broken out for Mobile Apps Programming as distinguished from the rest of Computer Technology, though this should be possible in the coming years. As of AY2016-17, the report from Computer Technology shows a high level of engagement of adjuncts in professional development and course revisions.

The key pieces of evidence for effective teaching are the outstanding teacher evaluations and low turnover rate of adjunct faculty in Mobile Apps Programming. Since inception of the program, not a single faculty member has left by choice or for poor performance. The program has two new adjunct faculty in 2018 to grow the program.

Additional data come from the 2016-17 annual adjunct faculty survey:

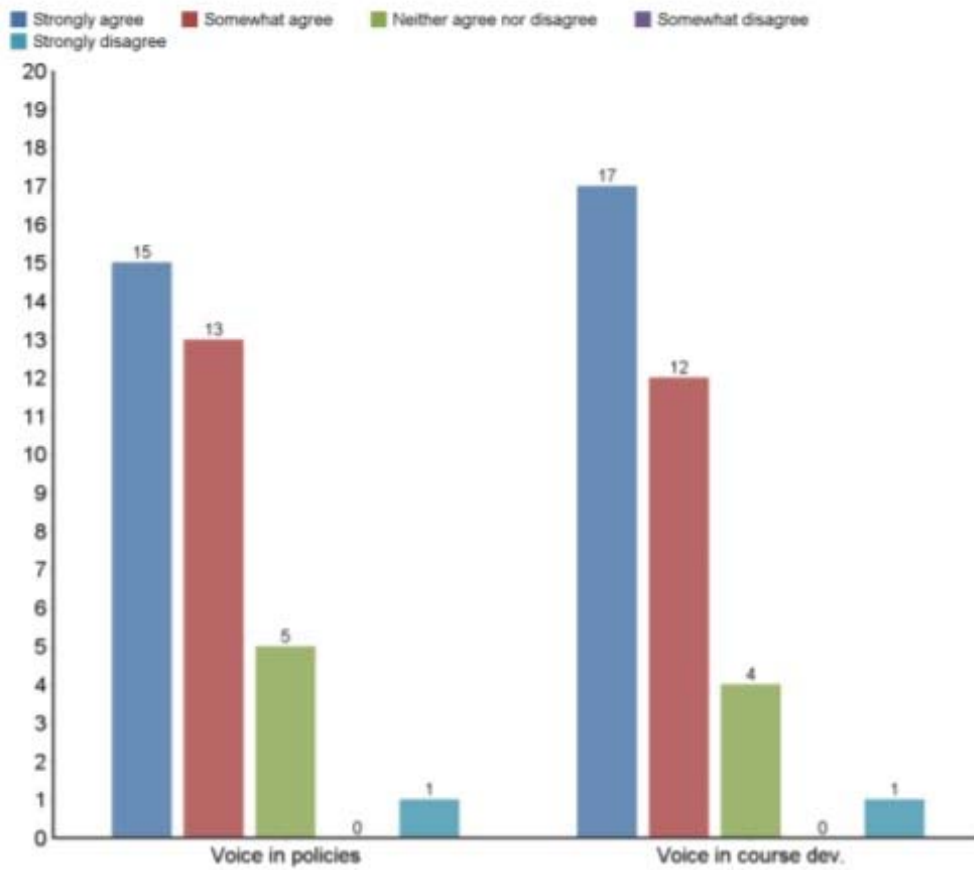
Faculty Teaching Support



#	Question	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
1	Rio Salado provides me with high quality Teaching strategies	58.82%	32.35%	2.94%	5.88%	0.00%
2	Rio Salado provides me with high quality Teaching tools.	67.65%	23.53%	5.88%	2.94%	0.00%
3	Rio Salado provides me with high quality Training.	44.12%	44.12%	8.82%	2.94%	0.00%
4	Rio Salado provides me with high quality Technical support.	58.82%	32.35%	5.88%	2.94%	0.00%

Statistic	Mean	Standard Deviation	n
Rio Salado provides me with high quality Teaching strategies	4.44	0.82	34
Rio Salado provides me with high quality Teaching tools.	4.56	0.75	34
Rio Salado provides me with high quality Training.	4.29	0.76	34
Rio Salado provides me with high quality Technical support.	4.47	0.75	34

Faculty Development



#	Question	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
1	I have a voice in the development of policies and procedures within my department.	44.12%	38.24%	14.71%	0.00%	2.94%
2	I have a voice in course development within my department.	50.00%	35.29%	11.76%	0.00%	2.94%

Statistic	Mean	Standard Deviation	n
I have a voice in the development of policies and procedures within my department.	4.21	0.91	34
I have a voice in course development within my department.	4.29	0.91	34

VIII. Retention and Persistence

2015		2016		2017	
Course Retention	Course Success	Course Retention	Course Success	Course Retention	Course Success
94.5%	84.5%	93.1%	73.3%	91.2%	67.8%

Note: Course Success = Grade A,B,C,P/any letter grade(includes withdraws). Course Retention = Grade A,B,C,D,F,P/any letter grade (includes withdraws).

	2015				2016				2017			
	Retention/Pass Rates		Withdraw/Fail Rates		Retention/Pass Rates		Withdraw/Fail Rates		Retention/Pass Rates		Withdraw/Fail Rates	
	Retain	Pass	W	D/F	Retain	Pass	W	D/F	Retain	Pass	W	D/F
CIS150-IN	*	*	*	*	*	*	*	*	85.7%	71.4%	14.3%	7.1%
CIS159-IN	100.0%	84.6%	0.0%	15.4%	88.5%	65.4%	11.5%	23.1%	89.3%	60.7%	10.7%	25.0%
CIS162AD-IN	94.4%	72.2%	5.6%	22.2%	93.3%	66.7%	6.7%	26.7%	96.4%	64.3%	3.6%	25.0%
CIS163AA-IN	95.2%	95.2%	4.8%	0.0%	90.9%	72.7%	9.1%	18.2%	89.5%	68.4%	10.5%	10.5%
CIS165-IN	*	*	*	*	*	*	*	*	*	*	*	*
CIS165DA-IN	*	*	*	*	*	*	*	*	90.0%	60.0%	10.0%	20.0%
CIS165DB-IN	*	*	*	*	*	*	*	*	*	*	*	*
CIS225AB-IN	100.0%	81.8%	0.0%	18.2%	100.0%	85.7%	0.0%	14.3%	90.0%	80.0%	10.0%	10.0%
CIS259-IN	*	*	*	*	*	*	*	*	*	*	*	*
CIS262AD-IN	*	*	*	*	*	*	*	*	*	*	*	*
CIS263AA-IN	90.9%	81.8%	9.1%	9.1%	100.0%	90.9%	0.0%	9.1%	*	*	*	*
CIS276DA-IN	94.7%	84.2%	5.3%	10.5%	90.0%	70.0%	10.0%	20.0%	86.7%	56.7%	13.3%	26.7%
Total-	94.5%	84.5%	5.5%	10.0%	93.1%	73.3%	6.9%	19.8%	91.2%	67.8%	8.8%	17.5%

*If no students enrolled or N < 10, percentages not computed

P= course success (A,B,C,P); F = course failure (D,F); W = course withdraw/incomplete (W,Y,I); R = course retention (A,B,C,D,F,P)

As a former VPAA noted in 2014, “You have great retention numbers! Your grade distribution illustrates this well- I find it interesting that students seem to really get A’s or F’s, with very few B, C, and D grades. I also appreciate you including suggested course pathways for your AAS and CCL as the District Curriculum Committee is looking for this to happen at all of the colleges for all programs.”

The trend, however, seems to be moving in the wrong direction – retention numbers and course success rates, although still excellent, are trending downwards. Closer analysis shows that CIS163AA (the highest enrollment class) may be the culprit. Closer analysis/assessment is warranted to justify possible course revision (a PDCA cycle) to increase retention in AY2018-19.

Cohort Term Start	Cohort (N)	% Persist to Following Term	% Persist to Following Year
4152	2	50.0%	50.0%
4156	10	40.0%	30.0%
4162	8	37.5%	37.5%
4166	10	60.0%	10.0%
4172	6	50.0%	n/a
Total	18	44.4%	44.4%

Notes. Cohort determined as first Fall or Spring term that a student declared the academic plan based on this review period. Course taking activities in summer term are rolled up into the next Fall term. Persistence to next term is Fall to Spring or Spring to Fall. Persistence to next year is Fall to Fall or Spring to Spring. % Persistence excludes graduates (Term Enrollees/(Initial Cohort - Grads to date)).

Cohort Term Start	Cohort (N)	% Persist to Following Term	% Persist to Following Year
4156	1	0.0%	100.0%
4162	1	100.0%	0.0%
Total	2	50.0%	50.0%

Notes. Cohort determined as first term that a student declared the academic plan and took core course during review period. Course taking activities in summer term are rolled up into the next Fall term. Persistence to next term is Fall to Spring or Spring to Fall. Persistence to next year is Fall to Fall or Spring to Spring. % Persistence excludes graduates (Term Enrollees/(Initial Cohort - Grads to date)).

Cohort Term Start	Cohort (N)	% Persist to Following Term	% Persist to Following Year
4146	13	38.5%	9.1%
4152	13	69.2%	50.0%
4156	14	38.5%	38.5%
4162	10	60.0%	22.2%
4166	16	33.3%	13.3%
4172	13	23.1%	n/a
Total	79	42.9%	21.4%

Notes. Cohort determined as first term that a student declared the academic plan and took core course during review period. Course taking activities in summer term are rolled up into the next Fall term. Persistence to next term is Fall to Spring or Spring to Fall. Persistence to next year is Fall to Fall or Spring to Spring. % Persistence excludes graduates (Term Enrollees/(Initial Cohort - Grads to date)).

The Ns here are really too small to make high quality decisions about persistence trends. There does not seem to be a pattern emerging from these historical data. Interventions for retention and student success follow the Computer Technology guidelines. Student Notes are used in RioLearn to communicate with students who are falling behind, performing poorly, or failing to log-in on a regular basis. Common announcements are shared through SharePoint to inform students about the next courses in the sequence and to encourage retention.

IX. Impact of Co-Curricular Programs

Table 12. Programming College-Wide Learning Outcomes for All Students and Co-Curricular Students

Learning Outcome	All Student Activities	Activities at College Level	Percent of Activities at College Level	Co-Curricular Activities	CC Activities at College Level	Percent of CC Activities at College Level
Critical Thinking	6	4	66.7%	3	3	100.0%
Information Literacy	3039	2716	89.4%	314	283	90.1%
Oral Communication						
Reading	3078	2751	89.4%	318	286	89.9%
Writing	3881	3468	89.4%	400	361	90.3%

A small proportion of students are in the Co-Curricular cohort. With the exception of Critical Thinking (with a very small N) there is not much difference in performance at the college level between all students and those in the Co-Curricular cohort.

As yet, there are no Honors-only courses in the program.

X. Program Resources

The program has been getting by with the assistance of a single lead faculty member at five hours per week. She has declined to serve in this role in the future, however, so the time is right to rethink long term program support. The program would grow and thrive with a half-time coordinator to assist the Chair – especially with Dual Enrollment options. The coordinator could be full time with expanded duties to other STEM areas such as Nanotechnology.

Marketing supplies help tell the Mobile Apps programming story as well. Program flyers should be redeveloped and placed into the labs. A new pull-up banner has been requisitioned for conference displays. The program is fortunate to be featured as one of the rotating banners in the RioLearn homepage.

Mobile Apps courses have a few library modules specifically designed to help programming students find resources. The modules were developed many years ago and should be updated. The program does not yet have a program-specific adviser, although it makes sense that the one identified for Nanotechnology would serve in this capacity. The Chair works closely with Tutoring and the Computer Labs to ensure students have support options.

XI. Program Recommendations, Decisions, and Action Plans

a. Program Best Practices

Some programming classes have been redeveloped using open educational resources (OER) to try and mitigate costs for frequent changes. These courses feature screencast videos to walk students through software installation and programming examples. CIS121AI and CIS150 are excellent examples of this strategy.

Another potential best practice is the integration of Cengage and MindTap for low-cost high-touch student engagement and practice. Although not yet in place, current efforts will be evaluated for expansion into Mobile Apps.

b. Program Viability

The program is right about where it should be. There is certainly room for growth, but in this first three year cycle the program has completed development, worked out the bugs, and is seeing enrollment growth. The first graduates were in 2018. With the addition of another course and a corresponding curriculum revision, the program is healthy and viable for the future.

c. Action Research Questions

1. How can Rio Salado College market and recruit more underserved, racial and ethnic minority, and female populations in Mobile Apps Programming?
2. What College and District systems can support the development of CIS265 in order to create and stack an Apple iOS programming certification as a micro-certification aligned with Mesa and the current Mobile Apps certificates and degree?
3. How should the Mobile Apps CCL be revised to bring in Python programming language?
4. Industry recommends the addition of a course in Cobol. Where in the program would this course fit, and is there a demand for it?
5. What can be done to reverse the trend of decreasing retention in CIS163AA?

d. Recommendations

- Retain the Mobile Apps CCL and AAS programs. Enrollment is growing and there is interest in the program.
- Update the library resources for Mobile Apps Programming.
- Hire a part-time coordinator to help grow the program, with a focus on special populations like Dual Enrollment, veterans, racial and ethnic minorities, and females.
- Add the level two Apple iOS course (CIS265) to the CCL so that the new iOS certificate (7214N) stacks within the Mobile Apps Certificate.

- Develop Python (CIS156) and have it listed as a programming option in the level 1 programming certificate (5047) and/or the Programming and Systems Analysis certificate (5048)
- Hire or train additional tutors in programming languages. Modify courses to include statements of tutoring options available in-person and through SmartThinking.
- Incorporate additional critical thinking and information literacy standards and linked assessments into the level one programming classes CIS159, CIS162AD, and CIS163AA.