



- Program evaluation: general considerations
- Evaluation design and procedures
- Implementing the evaluation: initial steps
- Evaluation timeline: early project period

Evaluating programs

- A systematic and rigorous investigation of
- Social science research methods
- Data collection + analysis
 A framework for informing decision making and improving program processes.
- and improving program processes
 (formative) and outcomes (summative)
- Interpreting performance measures

Outcomes evaluation

- Examines how program participation
 shapes participants
- Generally documents changes
 that occur in participants
- that occur in participants

 Focuses on program effectivenes

 Did the program succeed?
- Did the program succeed? If so, what program component

Evaluating programs

- A systematic and rigorous investigation of a program, process, or event
 - Social science research methods
 - Data collection + analysis
- A framework for informing decision making and improving program processes (formative) and outcomes (summative)
 - Interpreting performance measures

Outcomes evaluation

- Examines how program participation shapes participants
 - Generally documents changes that occur in participants
- Focuses on program effectiveness
 - Did the program succeed? If so, what program components were most effective?



Documenting program effectiveness

Evaluation framework

- · Social and behavioral science framework
 - Empirical, generalizable knowledge that advances body of evidence to enhance educational practices
- Result: resource-intensive, highlycoordinated evaluation activities



Specific requirements

- Competitive Preference Priority (2) USDE HSI-STEM =
 - Moderate evidence of effectiveness
 - Test participants prior to and after participation AND compare to a test of non-participants across multiple sites directly related to target population!

Evaluation framework

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Specific requirements

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> Moderate evidence of effectiveness

> > Test participants prior to and after participation AND compare to a test of non-participants across multiple sites directly related to target population!

Evaluation design

AIMS² Students

HSI STEM Grant Program

ivities participants





Logic model guides evaluation

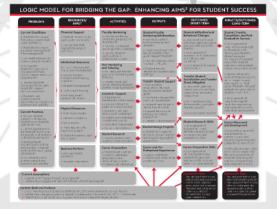
Visual representation of a systematic approach to linking program components to outcomes

Key components

Logic model guides evaluation

Visual representation of a systematic approach to linking program components to outcomes

Road map for success



What's the difference?

- · Activities= STEPS
- Who, what, where with participants
- Faculty meet with students weekly etc...

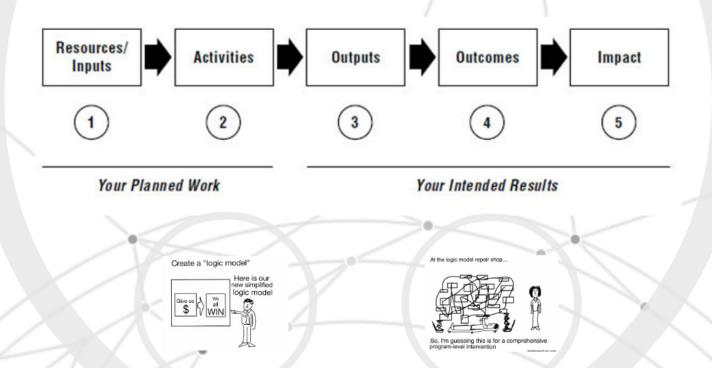
 Outputs= PRODUCTS
- How many participants served and what produced in activities
 A faculty research project where 10 students...
- Outcomes= BENEFITS
- Direct benefits from participation in activities associated with outputs Students learned or gained or etc.

What goes in?

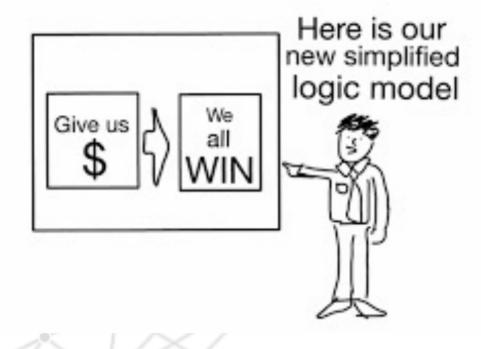
- · Problems are issues that the programs addresses
- · Resources/inputs are materials needed for activities
- · Activities are steps in program implementation
- · Outputs are products of program activities
- Outcomes are changes in program participants
- knowledge, beliefs, or behaviors



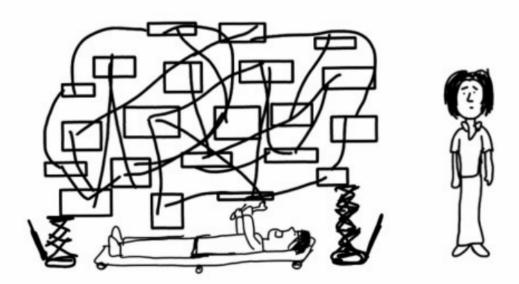
Key components



Create a "logic model"



At the logic model repair shop ...



So, I'm guessing this is for a comprehensive program-level intervention

freshspectrum com

What goes in?

- Problems are issues that the programs addresses
- Resources/inputs are materials needed for activities
- Activities are steps in program implementation
- Outputs are products of program activities
- Outcomes are changes in program participants' knowledge, beliefs, or behaviors
- Impacts are long-term outcomes



What's the difference?

- Activities= STEPS
 Who, what, where with participants
 Faculty meet with students weekly etc....
- Outputs= PRODUCTS
 How many participants served and what produced in activities

A faculty research project where 10 students...

Outcomes= BENEFITS
 Direct benefits from participation in activities associated with outputs
 Students learned or gained or etc.

Road map for success

LOGIC MODEL FOR BRIDGING THE GAP: ENHANCING AIMS2 FOR STUDENT SUCCESS

IMPACTS/OUTCOMES: LONG-TERM ACTIVITIES INPUT **Current Conditions** Financial Support Faculty Mentoring Student-Faculty Mentoring Relationships Completion, and Post-Graduation Success Behavioral Changes Students challenged Student incentives to Increased contac to balance coursework, work, and family Students challenged meetings, talks, workshops Weekly meetings with Faculty-student colleagues) to support successful student validation Intellectual Resources Development of course success skills and Tutoring students experiences disconnected from CSUN campus and CECS Student-faculty Pre- and post-transfer peer-peer mentoring and settings Transfer Student suite of student success skills—cognitive and Socialization and Transfe Transfer-ready and Shock Mitigation challenged to navigate, negotiate campus · Enrollment, gateway quide students into post mentor incoming students Academic Support Advisory Board member affiliations Students lack Peer tutors assigned to fundamental crash course business and industry Physical Resources Academic advisors/ **Current Practices** prerequisite course completion Minimal student 747 Customized workshops in math and English Transfer video resources Student Research Skills Career Placement Dedicated library books Student Design Projects Online video tutorials Limited opportunities research skills and Student development for students to develop meaningful relationships Undergraduate Career Preparation Skills Career Preparation Network of alumni who **Business Partners** Student participation Advisory board Few student career-

Summer job internship

0

- rrent AIMS² project model development

Disciplinary training/research orientation of CSUN and community college faculty Institutional changes across collaborative partnership sites and CSU-HSI STEM network Market specialization of Neudylegional businesses/hoopfort organizations

Regional employers

Project objectives

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- Improve the transfer of Hispanic and low-income students in engineering and computer science fields to baccalaureate-granting institutions.
- Improve academic achievement of Hispanic and lowincome students in engineering and computer science fields.
- Enhance **faculty and peer environments** for Hispanic and low-income students in engineering and computer science fields.
- Improve **career preparation** of Hispanic and low-income students in engineering and computer science fields.
- Develop research skills of Hispanic and low-income students in engineering and computer science fields.
- Increase baccalaureate degree completion of Hispanic and low-income students in engineering and computer science fields.

Focus on outcomes

Transfer
Academic achievement
Faculty and peer environments
Career preparation
Research skills
Baccalaureate degree completion

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Outcomes performance measures

Developed by USDE + articulated in 2016 HSI-STEM RFP = common set of measures

Community colleges

- % and number of Hispanic and low-income, full-time STEM students enrolled
- % Hispanic and low-income, first-time STEM students in 1st year in previous year = enrolled in 2nd year in STEM program
- Number of Hispanic and low-income students in project
- % Hispanic and low-income students in project who successfully completed gateway courses
- % Hispanic and low-income students in project in good academic standing

CSUN

- % and number of Hispanic and low-income, full-time STEM students enrolled
- % of Hispanic and low-income student transfers in STEM
- Number of Hispanic and low-income students in project
- % Hispanic and low-income students in projects who successfully completed gateway courses
- % Hispanic and low-income students in project in good academic standing
- % of Hispanic and low-income STEM transfer students on track to complete degree after 3 years
- % of Hispanic and low-income students in project who completed a degree

Fac

Bacc

Community colleges

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- % of His STEM
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Focus on outcomes

Transfer
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Career preparation
Research skills
laureate degree completion

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Objectives and Measures

Objective 1: Improve the academic achievement of Hispanic and lowincome students in engineering and computer science fields.

Performance Measure (1.1): The percent of Hispanic and low-income students who participated in grant-supported services or programs who successfully completed gateway courses.

Performance Measure (1.2): The percent of Hispanic and low-income students who participated in grant-supported services or programs in good academic standing.

Outcome Measure (1.3): Improvements in student success (non-cognitive) skills.

Objective 2: Enhance faculty and peer environments for Hispanic and lowincome students in engineering and computer science fields.

Performance Measure (2.1): The number of Hispanic and low-income students participating in grant-funded student support programs or services. Outcome Measure (2.2): Improvements in self-reports of quality, quantity, and effects of student-faculty and peer-peer interaction.

Objective 3: Improve the transfer of Hispanic and low-income students in engineering and computer science fields to baccalaureate-granting institutions.

Performance Measure (3.1): The percentage change, over the five-year grant period, of the number of Hispanic and low-income, full-time STEM field degree-seeking undergraduate students enrolled.

Performance Measure (3.2): The percentage of Hispanic and low-income, first-time STEM field degree-seeking undergraduate students who were in their first year of postsecondary enrollment in the previous year and are enrolled in the current year who remain in a STEM field degree/credential program.

Objective 4: Improve career preparation of Hispanic and low-income students in engineering and computer science fields.

Outcome Measure (4.1): Gains on measures of self-perceptions, attitudes, and skills related to career.

Objective 5: Develop research skills of Hispanic and low-income students in engineering and computer science.

Outcome Measure (5.1): Gains on measures of self-perceptions, attitudes, and skills related to research from URSSA survey and interviews.

Objective 6: Increase baccalaureate degree completion of Hispanic and low-income students in engineering and computer science fields.

Performance Measure (6.1): The percentage of Hispanic and low-income students transferring successfully to a four-year institution from a two-year institution and retained in a STEM field major.

Performance Measure (6.2): The percent of Hispanic and low-income STEM field major transfer students on track to complete a STEM field degree within three years from their transfer date.

Performance Measure (6.3): The percent of Hispanic and low-income students who participated in grant-supported services or programs and completed a degree or credential.

Evaluation design

AIMS² Students

HSI STEM Grant Program

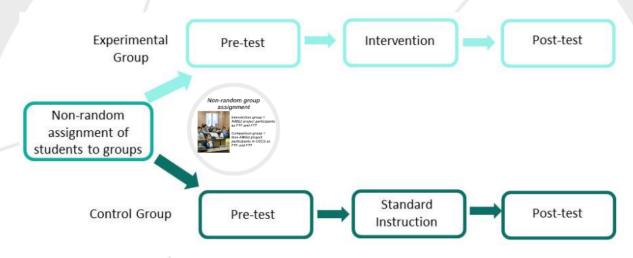
ivities participants





Dual design

Quasi-experimental



Observational

Retrospective:

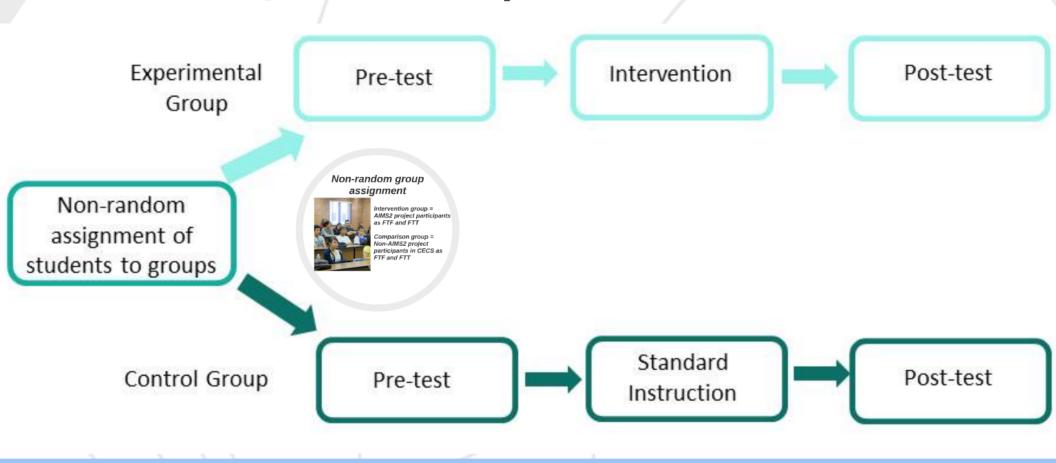
Subjects are selected and then their past conditions are observed

Prospective:

Subjects are followed to observe future outcomes

Dual design.

Quasi-experimental



Observational

Non-random group assignment

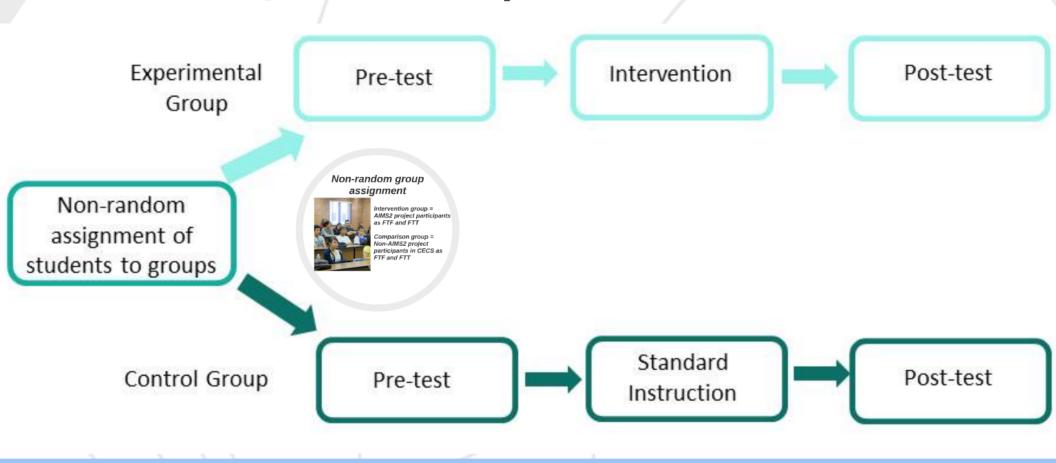


Intervention group = AIMS2 project participants as FTF and FTT

Comparison group = Non-AIMS2 project participants in CECS as FTF and FTT

Dual design.

Quasi-experimental



Observational



Observational

Retrospective:

Subjects are selected and then their past conditions are observed

Prospective:

Subjects are followed to observe future outcomes

Evaluation procedures

- Data sources include students and graduates
 - Community college, CSUN, CSUN graduates
- Mixed-methods approach with survey research and interview procedures

Mixed methods approach

Focus groups with AIMS2 participants at community colleges and CSUN and math participants at CSUN



Personal interviews with CSUN AIMS2 program graduates





LIST asks reposted about their infrareducing and infrareducing and

ENGINEERING MAJORS SURVEY



Institutional data to: (a)
explore patterns of AIMS2
and math participation,
course enrollment, course
success, and program
completion and (b) match to
EMS data for more robust
* data set





asks respondents about their ovation self-efficacy," expectations for outcomes of innovative behaviors and rests and goals around doing ovative work in their early careers"-five sections as follow:
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eliefs, expectations, and interests;
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ackground

Engineering Majors Survey (EMS)





EMS asks respondents about their "innovation self-efficacy," expectations for the outcomes of innovative behaviors and interests and goals around doing innovative work in their early careers"--with five sections as follow:

- 1. current plan of study;
- 2. school experiences;
- 3. beliefs, expectations, and interests;
- 4. future career goals; and
- 5. background



URSSA asks respondents about their:

- 1. skills such as lab work and communication;
- 2. conceptual knowledge and linkages in their field;
- 3. deeper understanding of the intellectual and practical work of science;
- 4. growth in confidence and adoption of the identity of scientist;
- 5. preparation for a career or graduate school in science;
- 6. greater clarity in understanding what career or educational path students might wish to pursue.

Undergraduate Research Student Self-Assessment (URSSA)

URSSA asks respondents about their:

- 1. skills such as lab work and communication;
- 2. conceptual knowledge and linkages in their field;
- 3. deeper understanding of the intellectual and practical work of science;
- 4. growth in confidence and adoption of the identity of scientist;
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explore patterns of AIMS2
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EMS data for more robust
* data set

















Focus groups with AIMS2
participants at
community colleges and
CSUN and math
participants at CSUN



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Personal interviews with CSUN AIMS2 program graduates



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Implementing the evaluation

- Human subjects protocol approval
- Initial data collection and analysis: survey and interview pilot tests
- Institutional data coordination and production
- Interim and annual compliance reporting
- Coordination of CSU Systemwide HSI-STEM Summative Evaluation

Human subjects protocol approval

CSUN IRB

- · Important protocol requirements:
 - · Subject recruitment
 - Procedures
 - · Risks and benefits
 - Confidentiality: data storage, management, and use
- Good news! Low risk and nonvulnerable population
- Great news! Expedited chair or designated member review, requests for revisions, and approval

Letter of permission

SAMPLE

March to come carrier

From the state that the Enters are more than execution a continuate mode of the continuate of the con

portanger trapes

Community college IRBs

Permissions from community colleges

Group interviews

- Participant recruitment via email and flyer invitations
- Facilities to conduct group interviews for assessment of project performance measures and annual reporting

Institutional data

- Coordination of institutional data requests with IR offices
- Permission to use deidentified, aggregate institutional data for assessment of project performance measures and annual reporting

Subject recruitment and data collection

- CSUN's IRB requires documentation that researchers have permission to recruit participants and collect data off campus
- AIMS2 participant focus groups on community college campuses and use of community college institutional data qualifies for letter of permission

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- Coordination of institutional data requests with IR offices
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Letter of permission

SAMPLE

{Letter must be on letterhead with original signature of authorized official}

Date

California State University, Northridge Standing Advisory Committee for the Protection of Human Subjects 18111 Northridge, CA 91330-8232

Dear Committee Members:

[Insert your name(s)] has permission to conduct the project entitled [insert title of project here] at [insert name of facility]. I have reviewed the project and am aware of all the activities involved in the project including [list all that are applicable, e.g., surveys, interviews, reviewing student records].

Signed,

[Insert name and title of authorized official]

Signature

Complete, sign, scan, and email to me!

Community college IRBs



If your campus has an IRB committee or office, please share with me. I'll need to work with your campus officer and you to coordinate approval.

t title of project re of all the surveys,



Complete, sign, scan, and email to me!

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Community college IRBs



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Santa Clarita Community College District Institutional Review Board

The Santa Clarita Community College District Institutional Review Board is charged with protecting the rights and welfare of human research subjects for projects in which the District is engaged.

Guided by the principles of The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research, the SCCCD IRB reviews all human research protocols in accordance with federal regulations, State laws, and local and District policies. The SCCCD IRB is comprised of members from various disciplines in the social/behavioral sciences, biological/physical sciences, nursing, institutional research office, and community/lay members (as needed) to assure a comprehensive review process. Through a collaborative partnership, the SCCCD IRB assists investigators in the protection of human subjects. These subjects are truly a scarce resource, worthy of our gratitude, respect, and protection. The District is committed to conducting its behavioral research involving human subjects under rigorous ethical principles.

Note to outside investigators: At this time the online submission process is not open to investigators that are not employed by the Santa Clarita Community College District (SCCCD). Non-SCCCD investigators involved in human subjects research that seek to access any SCCCD facilities, students or personnel (faculty, staff or administrators) must secure sponsorship from a SCCCD faculty, staff or administrator who will be responsible for submitting the proposal on their behalf. To help the SCCCD faculty, staff or administrator in submitting a proposal it is recommended that an electronic copy of the IRB proposal form from the home institution and a copy of the approval letter must be provided to the cochairs, if applicable.

IRB Pamphlet
Pamphlet

Initial data collection and analysis Survey and interview pilot tests

- Adapt EMS and URSSA to AMS2 program contexts
 - Initial administration of EMS (pretest) in Spring 2017 and URSSA (posttest) in Summer 2017 will be exploratory to confirm that the items that we ask are appropriate.
- Develop protocols for group interviews (student participants) and personal interviews (graduates)
- Pilot instruments with first few interviews and revise as needed = add follow-up questions as main questions, etc.

Institutional data coordination and production

Annual production of performance measure data for assessment and compliance

- % and number of Hispanic and low-income, fulltime STEM students enrolled
- % Hispanic and low-income, first-time STEM students in 1st year in previous year = enrolled in 2nd year in STEM program

s, etc.

Institutional data coordination and production

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- % Hispanic and low-income students in project in good academic standing

nunity college IR uests = aggregate only for annual pliance report e with you to coordinate

e with you to coordinat |submit requests!



Community college IR data requests = aggregate data only for annual compliance report

Collaborate with you to coordinate and submit requests!



We've successfully collaborated with AIMS2 CoC and GCC team members to support data for APR measures in the 2011 award!

Interim and annual compliance reporting



- Typically, we prepare and submit a annual performance report in the fall term for the previous project period.
- This project year, we will prepare multiple reports to comply with USDE requirements
 - 2016 interim and annual
 - 2011 final and possibly annual

2011 CSU av Bakersfield Channel Isla Fullerton Long Beach Northridge Monterey Ba Stanislaus

CSU Systemwide HSI-STEM Summative Evaluation

- System efforts to examine effects of program participation
- Coordinate data IR requests, participate in meetings, interviews, etc.



1 CSU awardees: kersfield annel Islands

lerton ng Beach 2016 CSU awardees:

Bakersfield

Channel Islands

Chico

Dominguez Hills

2011 CSU awardees: **Bakersfield Channel Islands Fullerton Long Beach** Northridge **Monterey Bay Stanislaus**

2016 CSU awardees: Bakersfield **Channel Islands** Chico **Dominguez Hills Fullerton** Humoldt **Long Beach** Northridge **Monterey Bay Pomona** San Bernardino San Marcos **Stanislaus**



Evaluation timeline [10] 23



Human subjects protocol and evaluation development

- IRB protocol development, submission, and approval Survey instrumentation: Engineering Majors Survey (EMS) Coordination and planning of data collection activities Compliance reporting schedule production.



Focus group interviews and data processing

- Empforatory facus group interviews with Spring 2017 AIMSZ FTF Cohort Tatlephone interview plots with AIMSZ cohort gradualts: Survey instrumentation: Undergraduate Research Student Self-Massessment (URSSA)
 Data processing/descriptive analysis: EMS

Instrumentation and survey administration

- EMS instrumentation: revisions from survey pilot and EMS administration with Fall 2017 AIMS2 FTT Cohort et. al.
 Thematic data analysis of focus groups and personal interviews:
- interviews
 IR data request coordiation for CSU Systemwide HSI-STEM Summative Evaluation



Mar-Apr 2017

Jul-Aug 2017

Nov-Dec 2017

Jan-Feb 2017

Survey pilot and interim reporting

Excellent Good

 Proc administration of EMS with Spring 2017 AIMS2 FTF Cohort
 Instrumentation: focus group and personal interview protocols
 Production of 2016 Production of 2016
 Interim Year 1 Report—
due in April
 Coordination of
institutional data requests
across sites

May-Jun 2017

Survey pilot and data processing

 URSSA pilot with AIMS2 faculity summer research student participants
 Transcription of exploratiory focus groups and telephone interviews. Descriptive data analysis of student achievement measures with softwire and telephone of the fores. with institutional data from Spring

Sep-Oct 2017

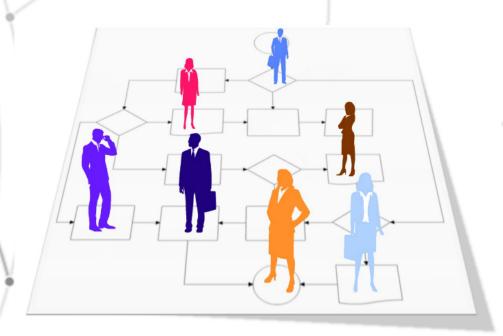
Data analysis and report development

- Performance report
- production:
 2011 Year 6 Annual
 Performance Report
 2011 Final Performance
- Report 2016 Annual Perl Report
- Institutional data and survey data analysis and display



Human subjects protocol and evaluation development

- IRB protocol development, submission, and approval
- Survey instrumentation: Engineering Majors Survey (EMS)
- Coordination and planning of data collection activities
- Compliance reporting schedule production



Survey pilot and interim reporting



- Pilot administration of EMS with Spring 2017 AIMS2 FTF Cohort
- Instrumentation: focus group and personal interview protocols
- Production of 2016
 Interim Year 1 Report-due in April
- Coordination of institutional data requests across sites

Focus group interviews and data processing

- Exploratory focus group interviews with Spring 2017 AIMS2 FTF Cohort
- Telephone interview pilot with AIMS2 cohort graduates
- Survey instrumentation: Undergraduate Research Student Self-Assessment (URSSA)
- Data processing/descriptive analysis: EMS



Survey pilot and data processing

Interviewer: Okay, that's fine! And what sort of magazines or newspapers do you tend to read or prefer?

Interviewee: None at all! Don't read magazines or newspapers!

Interviewer: Oh, okay, I take it you find most of your news or information online?

Interviewee: I find most of my main information- my main information source is BBC News online.

Interviewer: Great! What sort of genre of music would you say is your favourite, or that you prefer?

Interviewee: I started off, when I was younger, liking Northern American Soul, which I still do quite like; so that's stuff like Diana Ross and er, the good sort of dancing music. Then, when I was at Uni it was the time when Ua first came out, so Uz have been the big band influence in my life. Quite like The Waterboys as well, but to be bonest, I know this is quite shocking but I haven't had much time to develop my musical taste so I tend to just listen to what's out there but I'm really into some Christian worship music right now.

Interviewer: Okay great! So if you were to be sat down and shown a punk-rock video, from the original or modern day punk rock, what sort of stereotypes would you expect to see?

Interviewee: Original, '70s, I was there! Johnny Rotten, ginger hair, spiky hair, lots of people doing unpleasant things and basically chains and things round your pants!

Interviewer: "laughs" Okay! Um, so what sort of influences would convince you to buy an album or a punk rock album?

Interviewee: I would never buy a punk-rock album again! It's quite simply whether it appears on iTunes, or comes across on my radar screen.

Interviewer: I see! And finally could you name us maybe 3 of your top favourite bands at the moment?

Interviewee: At the moment, well top three bands would be U2, there is...The only other one that is significant is a band called Jesus Culture.

Interviewer: Okay! Thank you for your time!

Transcript: Interview 3

Interviewer: Okay, first of all, would you mind listing 5 hobbies or interests for us?

Interviewee: Well I like to read (not surprisingly since I used to be a former librarian), I like to listen to music, I like watching films, I like going to the cinema when I get the chance and I love travel; I love to travel.

Interviewer: Awesome! And what sort of magazines or newspapers do you prefer to read?

Interviewee: I don't read any newspapers to be honest with you, but I would read the occasional magazine, like Marie Clare or that kind of thing; Red, Chie and such.

- URSSA pilot with AIMS2 faculty summer research student participants
- Transcription of exploratory focus groups and telephone interviews
- Descriptive data analysis of student achievement measures with institutional data from Spring 2017

Instrumentation and survey administration

- EMS instrumentation: revisions from survey pilot and EMS administration with Fall 2017 AIMS2 FTT Cohort et. al.
- Thematic data analysis of focus groups and personal interviews
- IR data request coordiation for CSU Systemwide HSI-STEM
 Summative Evaluation



Data analysis and report development

- Performance report production:
 - 2011 Year 6 Annual Performance Report
 - 2011 Final Performance Report
 - 2016 Annual Performance Report
- Institutional data and survey data analysis and display



