

THE



CT UP

Achieving Critical
Transformations
in Undergraduate
Programs in
Mathematics

MATH

GUIDE TO UPLIFTING
STUDENT VOICES

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CSUEB Takeaways

Students have **EXPERTISE**

“Student NIC members being closer to the student experience that we were hoping to improve and having worked closely with other students gave important insight into our action plans.”

Students and faculty have **MUCH TO LEARN**

from **EACH OTHER**
skills like data analysis and confident communication.
Faculty learned about the student experience and the vulnerability that students feel in partnerships.”

Student-faculty partnerships can create
VALUABLE OPPORTUNITIES for students

“Students in our partnership presented at national conferences and were inspired to pursue further education (e.g., graduate school)”

Student and faculty contributions **IMPROVE**
the **QUALITY** of the **OUTCOMES**

“The action plans we created as a group were more thorough and beneficial to students because the variety of lived experiences in the room helped us get closer to optimizing our impact.”

ENHANCES AWARENESS of institutional
structures and areas within them that can

“Our NIC activities opened our **BENEFIT** from **CHANGE**
eyes to what is actually happening outside of our own
experiences, for example in exploring data related to and
discussing the experiences of first generation college students.”

BUILDS SKILLS as teachers and community

“Faculty and student NIC members felt like we members
improved as teachers, for example in gaining appreciation for the
role of community-building activities in the classroom.”

Symptoms of a NIC

Are you finding yourself building a community with others who have different roles and experiences?

Are you focused on a common systemic improvement aim?

Did your group use data to develop specific improvement plans?

Are you deploying the rigor of improvement science?

Are you networked with external improvement groups to accelerate progress?

If you answered “yes” to these questions, you may be part of a NIC

**Networked
Improvement
Community**

Visualizing Critical Transformation

Please create or take a picture related to your experience of engaging as a NIC member working toward critical changes.

WE'RE THE LOWER DECK
STAR TREK CREW

YOU ARE A ROOTED
TREE, SUPPORTING
STUDENTS AS THE
BRANCHES

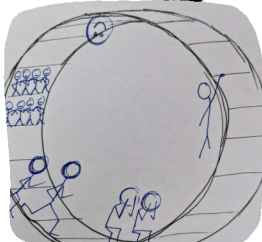
Engaging in Critical
Transformation as a Process

Relation of self to
NIC members

YOU'RE UNDERWATER
BUT SOMEONE IS
REACHING IN TO PULL
YOU OUT

EACH OF OUR NIC MEMBERS IS A
NODE WITHIN A NETWORK. AND THE
EDGES OF THIS GRAPH REPRESENT
OUR EXCHANGES

Emotions



THE TRANSFORMATIVE POWER OF STUDENT PARTNERS!

MAD LIB EDITION

It's hard to ignore the _____ (plural noun) when the _____ (same plural noun) is in the room! Engaging students as partners in change efforts has immense benefits for tertiary education. This approach fosters a sense of _____ (noun) and responsibility, leading to increased _____ (adjective) engagement and improved _____ (noun) outcomes.

When students become _____ (plural noun) in change efforts, they adopt various roles, such as democratic _____ (plural noun), _____ (noun) (like a skilled helper), or even _____ (noun) providing advice. These partnerships challenge traditional _____ (plural noun) and promote a culture of _____ (noun) and innovation.

Key to successful partnerships are principles like mutual _____ (noun), _____ (noun) (giving and taking), and deep _____ (noun). Students develop valuable _____ (plural noun) such as critical _____ (noun), problem-solving, and _____ (noun). While there can be _____ (plural noun) like ensuring diverse participation and managing _____ (plural noun) relationships, the overall impact is a more _____ (adjective) and equitable learning environment for all.

THE TRANSFORMATIVE POWER OF STUDENT PARTNERS! MAD LIB EDITION (ANSWERS)

It's hard to ignore the data when the data is in the room! Engaging students as partners in change efforts has immense benefits for tertiary education. This approach fosters a sense of ownership and responsibility, leading to increased student engagement and improved learning outcomes.

When students become partners in change efforts, they adopt various roles, such as democratic participants, apprentice (like a skilled helper), or even consultant providing advice. These partnerships challenge traditional hierarchies and promote a culture of co-creation and innovation.

Key to successful partnerships are principles like mutual respect, reciprocity (giving and taking), and deep knowledge. Students develop valuable skills such as critical thinking, problem-solving, and leadership. While there can be challenges like ensuring diverse participation and managing power relationships, the overall impact is a more relevant and equitable learning environment for all.

Check out the following research article to learn more!

Bolick, M. A., Pai, L., Funk, R., & Voigt, M. (2025). It's hard to ignore the data when the data is in the room: Examining the role of students as partners in critically-oriented reform of tertiary mathematics. *International Journal for Students as Partners*, 9(1).
<https://doi.org/10.15173/ij sap.v9i1.5948>

TRUE OR FALSE

TEST YOUR KNOWLEDGE OF CREATING A SUCCESSFUL NETWORKED IMPROVEMENT COMMUNITY (NIC)

A. When creating a NIC, you should plan to have no general structure.

TRUE OR FALSE

B. Members engaging in the NIC should be well-compensated.

TRUE OR FALSE

C. Not all NIC members need to be compensated equally.

TRUE OR FALSE

D. It's important to include individuals with different perspectives (e.g., administrators, students, etc.) in the NIC.

TRUE OR FALSE

E. There's no need to mitigate power dynamics between different NIC members because power dynamics don't exist.

TRUE OR FALSE

F. Institutional support is not necessary for a successful NIC.

TRUE OR FALSE

G. The NIC should reach out to individuals directly affected by the NIC's goal.

TRUE OR FALSE

H. The NIC should never adapt to peoples' schedules, evolving roles, etc. The structure must stay the same from the beginning.

TRUE OR FALSE

ANSWERS

A. False B. True C. False D. True
E. False F. False G. True H. False

GET STARTED THINKING ABOUT YOUR NIC



EXPECTATIONS

(THINGS TO THINK ABOUT
BEFORE YOU START)



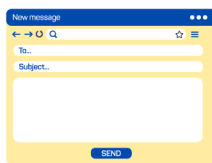
- What is the general structure going to be?
- What resources do you have to work with (e.g., compensation for members and funding for action projects)?
- Is this a new group or a new iteration of an existing group/community?
- Is there a goal already going in, or will the NIC develop goals as a group?
- What institutional supports does your NIC have in place? These will shape your spheres of influence.
- Why is student experience going to be valuable in this NIC?
- Are you aware of different power dynamics in your NIC and at your institution?
- How will your NIC be adaptable to change?





Recruitment

Recruit broadly



Recruit personally, talk to students you know might be interested or email them directly.

Advertise what students stand to gain (skills and compensation).



Be explicit about any particular focus for the work (e.g., is it to improve teaching, equity, data-informed decisions).

Be specific about time commitment, compensation, and scheduling constraints.



Place clear value on student experience and what student members bring to the table by just being themselves.





Norms + Community Building

- In the first meeting, take time to set community agreements/norms.
- Outside of the specific NIC goals, spend time on community-building activities that are fun and invite vulnerability and depth.
- Explicitly name power dynamics and express intentions for how to push back on them in the group
- Spend time each meeting on community building (for example, meaningful icebreaker questions)

*Tell a story
about a time
that you felt
confident!*

*What aspects
of your
identity make
you proud?*

recipe for setting norms



- Have each person contribute 1-2 suggestions anonymously on a post-it.
- Consolidate similar suggestions.
- Make a slide with norms to come back to each meeting.



THE GAME OF INCLUSION

A game that helps **YOU** become an expert in creating an inclusive space for collaboration and problem solving with people of varying backgrounds in the academic space!

LEVEL 1

You must complete all adventures before advancing levels!

ADVENTURE #1



Anonymous contributions ensure equal and honest participation.

Establishing community norms creates expectations, odd behavior, and highlights group values.



ADVENTURE #2



ADVENTURE #3



Acknowledging the value of each person's unique experience helps break down hierarchical barriers.

LEVEL 2

You must complete all adventures before advancing levels!

ADVENTURE #1



Post-It sharing of ideas allows for slight detachment during collaboration to help those that are nervous.



Norm amendments helps establish equal ownership of the space and its expectations.



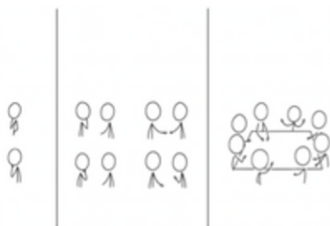
ADVENTURE #2



ADVENTURE #3



Think-Pair-Share and small group collaboration is a stepping stone to all out participation, and reinforces the value of each individual contribution.



LEVEL 3

Can you discover Level 4 after completing these adventures? Do we start back at Level 1? Is it totally different?

ADVENTURE #1



Shared facilitation gives all members a chance to highlight tasks or topics they feel are important and need attention.

Giving responsibility and ownership of project pieces emphasizes the value of contributions, and opens projects up to new approaches to solutions.



ADVENTURE #2



ADVENTURE #3



Revisiting Level 1 and 2 adventures allows for reinforcement and the ability to create a welcoming space for new members.



HOT

THINGS WE
THINK ARE "IN"



ANONYMOUS
contributions

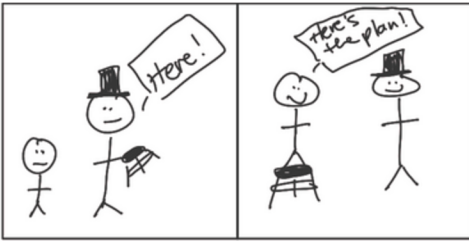


**First name
basis**



STUDENTS actively

ENCOURAGED TO PARTICIPATE



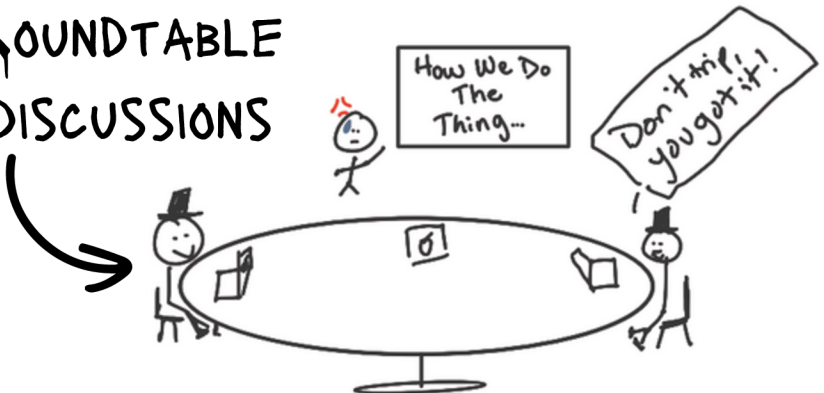
**Student
ownership of
parts of the
Process**



Equal compensation



**ROUNDTABLE
DISCUSSIONS**

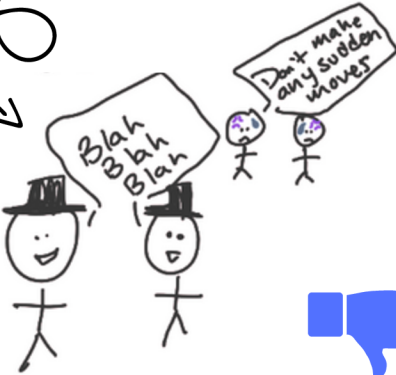




Things we think are "out"

NOT

Students mostly observe



Faculty at the "head of the table"



Emphasis on titles (e.g., "Professor")



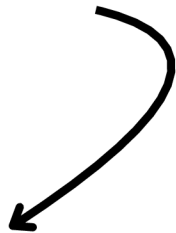
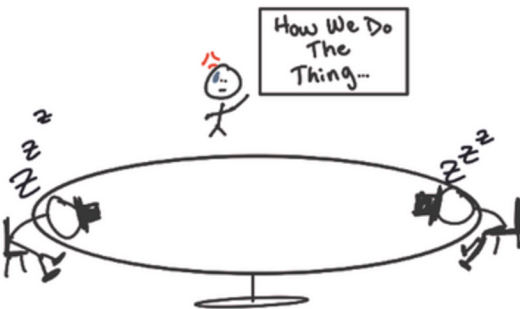
Loudest/first contributions **DOMINATE**



Student roles are determined by faculty decisions



Student contributions are superficial or dismissed.



How is a NIC like a puzzle?

Each person brings their own personality, perspectives, and ideas

Incorporating fun & play builds community relationships

Intentionally flattening power dynamics so we are all in the same plane gives everyone a chance to contribute

Communication, teamwork, & distributed leadership solve problems harder than we could tackle on our own

Our past experiences color our contributions to the group

Diversity & uniquely shaped pieces of us fit together to enrich the process & product

When we nurture relationships, people are willing to be vulnerable and open to sharing their talents, thoughts, and viewpoints

The whole is greater than the sum of the parts

Documentation captures progress

puzzle collage created by members of ACT UP Math research team in June, 2025



(IMAGINED) POWER DIFFERENTIAL

there's a power differential
they make more [money]
they have a different kind of job security
I am beholden to them for my job
age is in there as well: student perspectives are
valued in the abstract
dismissed as youthful optimism on the other hand
sometimes I feel
there's a decision-making process I'm not aware of
I don't have decision-making clout in that way

we graduate students are a strange middle ground
students in some spaces
workers, instructors in others
many a student
I've spent many years as
not an instructor
we are given certain credibility
undergrads instructors
see us as who are closer to them
faculty students

there's also an imagined power differential
due to anxiety or uncertainty
there is something I feel I can't say
as a trans graduate student
relationships deconstruct an imagined power differential
break down power dynamics
build community, build trust

TRUST CAN BE A POWERFUL FORCE

sometimes I feel

uncertain, uncertain, unsure, uncertain, uncertain
not yet totally safe
defensive, frustrated, pessimistic

trust can be a powerful force

for continuing efforts,
for getting honest conversations going
it is difficult to talk about being transgender
in a room full of cisgender humans

now that we're in this sub-team structure

there is more flexibility

we have space to exercise our student expertise

she commented on my expertise

as recently an undergraduate

as an early practitioner in the classroom

as a trans person

contributed to my sense of safety

I feel seen as a person with some expertise

remember that every single person

is a whole human being:

a holistic and humble centering

we've got a lot going on too

it's complicated

we all communicate in different ways

we need to be together for us all to grow and improve

both students and instructors

we leverage each other's resources and knowledge

ENDURING IMPACT

success looks like we've tried some stuff
it doesn't have to be perfect
movement, experimenting. experimenting, movement

a trend we identified in our data analysis:
faculty overestimate
the community that students actually experience
there's something to be said about
students having opportunities:
to share their experiences
to build greater confidence
to connect to the department
students learning skills:
data analysis
practical implementation

the qualitative research of focus group data
informed my professional interests,
I'm more attuned to rigor and conceptual content
a strength I've always had is being critical
there's an art to being critical in an actionable way

we encourage each other to challenge our core beliefs
we all have shared responsibility
an enduring impact in leading by example
I learn a lot from
listening, speaking, listening, reflecting
I've changed
directly because of conversations in the NIC

NOTHING ABOUT US WITHOUT US

Going in,

I was going to work and get paid.

It was going to be a research team:

we work towards a specific goal,

we publish findings,

and there wasn't going to be any kind of personability
or any level of deep social interaction.

The first two meetings really pushed those emotions out of the way:

Hey, introduce yourself!

Hey, you have a personal experience--

What is local community college like?

A lot of professors don't want to hear about your experiences,

But these professors did

It wasn't the fact that they were professors,

It had more to do with the fact that we were in the NIC.

Certain professors struggle to think from the student's perspective
when it comes to student learning experience.

Trying to think from a student's perspective in the classroom
is a very niche skill.

If you want to transform the student body's experience,
you definitely can't do that without involving the student body.
Nothing about us without us.

Whenever we had to pair off, it became:

Who is more experienced in these things?

How we can use our experiences collectively to solve the problem.

Rather than, "oh, I have this title."

It had more to do with, "**we** have this problem."

And so it really felt like you were in the room full of equals

who had more experience,

but definitely didn't hold that experience over you.

It definitely didn't feel like a company

It felt more like we're all working here together towards a problem.

We're family here.

It's a feeling of accomplishment:

We did that

A POEM TRANSCRIBED FROM AN INTERVIEW OF A NIC MEMBER

very nervous very nervous in the beginning
always worried always worried in the beginning
I'm someone that needs feedback all of the professors
ended up giving me a lot of positive feedback
she ended up giving me a lot of positive feedback
she really enjoyed working with me positive feedback
really empowered really empowered
made me actually feel really empowered
more comfortable comfortable answering
more confident have something to say
I was able to share everything that I had to say
she was also sharing everything she had to say too
very equal
very equal
communicating as peers

A POEM TRANSCRIBED FROM AN INTERVIEW OF A NIC MEMBER

WE ARE ALL JUST HUMANS

We are all humans.

We make mistakes.

Some people are more experienced than others,
but that doesn't mean we can't learn from each other.

We met monthly.

Each time, I felt more at ease.

I feel relaxed with them now.

I learned a lot since the last professor,
especially how I felt when we didn't get along.
That stayed with me.

But THEY didn't make me feel that way.

They helped me find my voice.

They showed me I can help other students.

They made me feel empowered,

Like my actions could make a difference.

I learned about the qualities of a classroom:

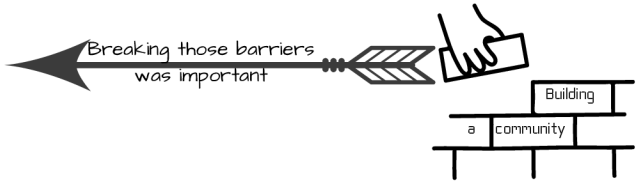
Patience, communication, and passion.

We are all just humans.

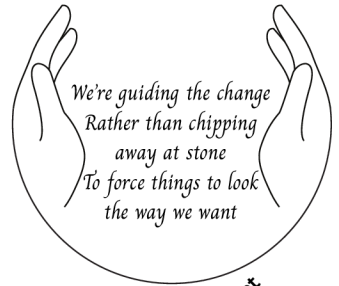
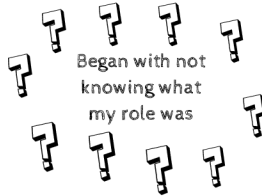
And we're all still learning.

Developing Through the NIC

Surrounding them is the system
STUDENTS ARE IN
THIS BUBBLE
Surrounding them is the system

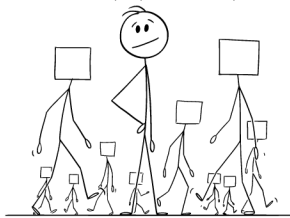


IN THE BEGINNING
IT WAS REALLY
AWKWARD



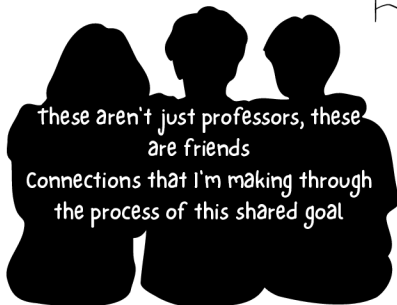
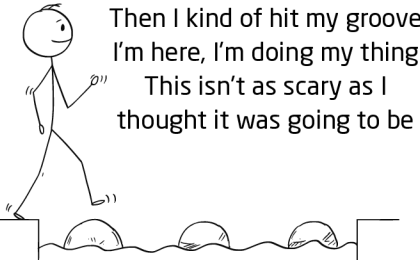
**ACKNOWLEDGING
UNIQUENESS OF
STUDENTS AND
EXPERIENCES**

Understanding why you want to make change is vital
It affects the people that are part of it



It'll affect what you do, it'll affect the students

The system needs to pivot
in order to create
sustainable change
That's where you're going
to really see long term
systematic change



LETTING STUDENTS
BECOME THE PUPPETEER



Really making it happen

A POEM TRANSCRIBED FROM AN INTERVIEW OF A NIC MEMBER

Students, Students, Students: Trust Students

trust **students**
to impact **students**
nothing about us
without us

half my life is going to meetings
this felt different
it really felt more like
a community
we're getting to know people
we're really caring
more invested in each other

having the **students**
was a huge piece
we're a small department
I would encourage everyone
to have **students** in the room
and to pay their **students** well

everything was impacted
by having **students**
A lot of **students**
from the beginning
it changed the tone
in the room
every
single
piece of the conversation
and every
single
reflection that we did
we're not talking as
us about them
we're talking as
all of us
collectively
student and faculty
about **students**

as faculty
we often default to experience
as faculty
it's been so long since
we've been **students**
that's not the primary hat
we're wearing

every time we're thinking
about doing something
to impact **students**
we have **students**
in the room
saying
I would feel nervous about that
this is really different
from what I experienced
in xyz situation
I don't know that I could
imagine
what the NIC would have done
if it was just faculty

it
would
have
been
not
even
anywhere
close
as
awesome

at the beginning
we do a lot of turn taking
we do posted activities
we do a lot of anonymous
contributions
voting

in the onboarding
it's hard to tell
is it nervousness?
shyness?
wanting to speak up?
really thinking
what things we can do

because **students** were nervous
three of your
actual right now
professors
are in this room with you

It was hard
go from a NIC meeting
15 minutes later
you're the instructor
leading a class
with a NIC member
in the class
it was really hard
for the **students** too

power structures exist
be transparent
compartmentalize
I'm never going to talk
about your grades
in the NIC meeting

you've mitigated power dynamics
those can still exist
we had a department chair
in the room
push myself
to push back
even though
in another context
I might not

we can hold this professional dynamic
we are colleagues
we built a lot of trust
it's a trusting space
it's a trusting professional space
I've said this before
trust **students**

trust **students**
to make their placement decisions
to lead projects
they're the experts
in their own experience

trusting, trusting **students**
to be more involved in
all aspects of what we do

the system is so broken
the placement system
was so clearly broken
are we okay with that?
who are we to decide?
who are we to be that gatekeeper?
trust **students**
to make the decision
ask for
student feedback
it impacts **students**

as faculty
as mathematicians
we've worked with so many **students**
we've seen the points where **students**
struggle
we think we know what's best
but we don't
any individual **student**
is going to know so much more
about themselves
than we will ever know
about them

how can we use what we know
to give them more information
more trust
instead of making decisions
on their behalf

SPINNING IN CIRCLES

A node of some kind of network that was taking place.

The edges of this graph that we make

Our exchanges

Sometimes not even exchanges between members

Thinking about myself in the very beginning

Spinning in circles, not understanding what was going on

Trying to acclimate to the environment.

Start asking questions

Loaded questions

Why does something work this way?

Why is this worth knowing?

What are we doing here?

Just as valid a question as anything

A great place to start understanding what's going on around us.

Wanting to truly understand what was going on

Motivate the underlying need to understand this information

Having something to report back on and contribute

Stepping up even more

Leading meetings

Taking responsibility

Whether you are a student or faculty

Involved in the system at whatever level

You can appreciate it

Different perspectives

Living on the borderline

Getting to wear different hats

Sometimes you don't know what you're looking for until you see it

Working together

Making all of our voices heard.





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<https://scimath.unl.edu/act-math/>