Data Literacy

Data-Informed Decision-Making Process

1. Ask Questions
2. Collect Data
3. Analyze and Interpret Data
4. Report Results
5. Make Decisions
6. Assess Decisions - *We fail our institution if we do not assess decision.*

Overview

Descriptive Analytics: "what happened?"

Diagnostic Analytics: "why did it happen?"

Predictive Analytics: "what might happen in the future?"

Prescriptive Analytics: "how might we best respond to those future events?"

Higher Ed Student Success Terminology

- Certificate (shorter and focused) vs Degree Program (robust)
- Full-time: 12 or more credits per semester or 9 for grads
- Part-time: 12 or less or 9 or less for grads
- First-Year Students: new to that institution, and includes First-Time Students versus Transfer-In Students
- Transfer-Out Student: leaves and enrolls at another versus Swirling Student: attends multiple at the same time or leaves and returns multiple times
- 38% of students transfer once before completing their degree
- Stop-Out (leave but return) versus Drop-Out (do not return)
- 37% of students never complete a degree
- Traditional Student (27%) (enters college full time after completing high school, no children, and do not work or only work full time) versus Non-Traditional Student (73%) (anyone else).
- Cohort: group of students with something in common: age, major, or Fall Cohort (whole class)
- Credit Completion Ratio: Credit Hours Attempted versus Credit Hours Completed (listed as a percent)
- Credit Accumulation Rate: % of students earning 30 or more credits a year
- Academic Momentum: speed of credit accumulation during first year. Only 41% of first-time full-time students complete a bachelor's degree in 4 years.
- Gateway Courses: entry-level credit-bearing college-level course (introductory courses in a student's major, large lecture)
- Fall-to-Fall Retention Rate: check who reenrolls as a percentage (average is 81%)
- Completion Rate: percentage of cohort who go on to complete degree
- High-Impact Practice: an experience especially beneficial to first-year students (first-year experience, read a common book, learning communities, writing courses, collaborative

projects, study abroad, ePortfolios, community-based projects, internships, capstone courses)
- First-Generation Student: first in immediate family to attend or any student who's parents didn't complete degrees
- Student Headcount (all students counted once) versus Full-time Equivalent (# credits earned divided by 30 credits per year = number of full-time equivalent students)
- Cumulative Grade Point Average (GPA)
- Student Unit Record: can include demographic data, financial aid history, enrollment history

Equity Gaps in Education

Equity Gap: Disparities in academic outcomes between groups of students (can include race/ethnicity, gender, first-generation status, disability, socioeconomic status)

Equity (provide students what they specifically need to achieve the same outcomes) versus Equality (everyone treated the same)

Ideally, you work toward removing the root cause of the inequity and then special treatment is not need, the structural barriers

Structural Barriers to Equality:

- Cafeteria Model (course catalog where students are in charge)
- Lack of linking between major and career by the institution.
- Key Performance Indicators (KPIs): data points tracked on an ongoing basis to help us know if we are meeting our institutional goals.
- Lagging KPIs (GPA, retention, completion) versus Leading KPIs (credit accumulation rate, credit completion ratio, time to credential/degree)
- Data Capacity: the ability of an institution to produce information for decision making.
- Data-Informed Decision Culture: everyone at the institute can contribute to the collection/analysis of data if set up properly

Research

Interest leading to inquiry.

Barriers to Curiosity:

- Fear costly solutions
- Value efficiency over curiosity
- Leaders may see it as a challenge authority
- Fear and assumptions (about asking questions)

Curious People look for answers in unlikely places (Why do we do it this way?) and let go of the past

How to Build Curiosity:

- Hire curious people
- Model curiosity yourself
- Focus on learning
- Explore and reward new ideas
- Ask good questions - *This is better than giving good answers.*

Building Habits

Feedback Loop: Cue > Routine > Reward

Proactive (not Reactive) Leaders:

- Clear mission and inspires others to meet mission
- Thinks long term regardless of short-term challenges
- Celebrates thinking, listening, communicating
- Highly organized and efficient
- Promote curiosity and problem solving
- Seek advice and help as needed
- Remain calm under pressure
- Encourage feedback
- Utilize team strengths

Research is:

- Systematic
- Logical
- Empirical
- Replicable

Writing Research Questions:

1. Identify Research Project Scope
2. Search and document prior work to help you:
    - Ask better questions
    - Collect different data
    - Report our finding differently
3. Identify constraints such as:
    - Data collection
    - Study participants
    - Time
    - Support
    - Financial burdens
    - Lack of buy in
4. Write the research questions
    - 3-5 questions

- Descriptive enough to understand
- But concise as possible
- Not yes or no answers
- Reasonable scope
- Examine each against prior work and constraints and edit as needed

Create Research Plan

Research plans help defend the results and repeat the project.

1. Describe the project, focus, sampling techniques
   - Summarize prior work
   - Identify constraints
   - List research questions

2. Describe the data that will be used and how it was collected
   - Describe the analysis used to summarize the results
   - Describe context in which the data was interpreted

3. Describe the data that was used in the final report
   - Connect a copy of the final written report/presentation
   - Identify the recommendations made and who drafted them

4. Describe decisions made based on results
   - Describe any improvement actions and how they were implemented
   - Describe how those decisions were assessed and the results on that

Unethical Use of Data

- When data is skewed to fit a narrative
- When data is accidentally or purposefully misused
- When our own biases come into play

Types of Biases

Confirmation Bias: looking for what you expect to find, ignoring other things

Data Collection Biases: who is surveyed, who is not

Analysis/Interpretations Biases: focusing on the data we like

Reporting Bias: not reporting bad things

Decision-making Bias: what decisions you take as the result of the data

Assessment and CQI

Important for accountability and improvement.

Steps of Assessment

1. Establish, adjust, or maintain performance metrics
2. Identify, collect, analyze, and report assessment data
3. Review information and identify improvements
4. Implement improvement plans

Types of Assessment

What? Types - Program Assessment or Learning Assessment
When? Types - Needs Assessment (Before), Formative Assessment (During), or Summative Assessment (After)

Assessment Measures

Direct - Performance measures, unbiased, more expensive EX: observation, grades
Indirect - Suggest effectiveness without demonstration, can be biased, cheaper - *For example: surveys, focus group, peer reviews*.

Continuous Quality Improvement (CQI): improve not just during large assessments, but all the time with small changes.

1. Establish an expectation of quality - set goals, understand stakeholder needs
2. Create quality improvement teams - meet regularly, identify specific areas, brainstorm solutions, keep unit updated on progress

Teams can use the PDSA Method (Plan, Do, Study, Act) as a simple method to implement CQI.

Benefits of CQI

- reduces errors
- improves satisfaction
- improves efficiencies
- increases creativity
- involves and empowers everyone
- improves student success.

Challenges to CQI

- lack of commitment - ask leadership for 1-year commitment up front
- limited resources - focus on low-cost projects
- time constraints - show improvement in work processes
- people don't like change - improve those people's work environment

Understanding Data

- Constant Data (same value) vs Variable Data (different values)
- Quantitative Data (Numbers, What Happened) vs Qualitative Data (Words, Why)
- Structured Data (fits into spreadsheets) vs Unstructured Data (everything not already in spreadsheets)
- Discrete Variables (fixed number of a few values) vs Continuous Variables (many possible values)
- Live Data (updates in real time) vs Frozen Data (a pull from a database)
- Scheduled Data (extracted on a schedule) vs Ad Hoc Data (collected or pulled as needed)
- Administrative Data (collected in support of business practices) vs Non-Administrative Data (student behavior, motivation, and learning)
- Cross-Sectional Data (single point in time) vs Longitudinal Data (multiple points in time)
- Digital Data (security, obsoletion, backup) vs Paper Data (space, not easily altered, deteriorates)
- Existing Data vs New Data (costly, difficult, reliability)
- Internal Data (easy access, limited scope) vs External Data (broader)
- Objective Data (measurable) vs Subjective Data (opinion, perception)
- Primary Source (source that generated the data) vs Secondary Source (any other source)

Collecting Data

Types of Survey Questions

- Likert-Scaled Questions (Strongly disagree to Strongly Agree, or similar scale)
- Categorical Questions (Which best describes..., include other option if you aren't sure you have all options)
- Open-Ended Text Questions (ask focused questions for this, "Why did you choose not to participate in X", limit these because they are time consuming for all parties)
- Multiple Response Questions
- Ranking Questions
- Numeric Questions

Must have BOTH reliability and validity (face and content validity).

Samples

A sample is a portion of the population to be surveyed.
To calculate a sample size, use confidence level (95% or 99%), confidence interval, and population.
Check representativeness to determine if responses are accurate to the sample.
Look out for Non-Response Bias.

Types of Sampling

Purposive Sampling: participants are selected based on characteristics and their relationship to the research question (better focused, but prone to bias)
Quota Sampling: divide population into subgroups, then sample in the same proportions as exist in

the whole population (less bias, but may lose randomness)
Snowball Sampling: those who have already participated find and select others who mee the criteria (helps get a study started if we don't know who to ask, prone to oversampling)

Qualitative Data Collection

- Focus Groups - 5-10 people, who interact and brainstorm, typ. 1 hour, recorded
- Interviews - one-on-one with moderator, good for sensitive subjects, typ. 1 hour, recorded
- Indirect Observations - limited interaction between researcher and participants (what doors on a building are people using, cameras recording participation)
- Direct Observations - researcher is both observer and participant (secret shopping at a dining hall to see why certain vendors aren't doing well)
- Document Analysis - looking at public records (syllabi), personal documents (vlogs, pictures, art, social media), and physical evidence (flyers, posters)

Qualitative Data Reliability and Validity:

- Credibility - use multiple methods, datasets, researchers, and perspectives
- Transferability - can be applied to other institutions with similar settings
- Dependability - can be collected at a different time with similar results
- Confirmability - how well the researcher was able to be objective, create an audit trail to demonstrate measures to avoid bias

How to Ask Good Survey Questions

- Don't ask double-barreled questions
- Don't ask loaded questions
- Don't ask leading questions
- Avoid the absolute question
- Avoid acronyms, abbreviations, and jargon
- Avoid "negative" words
- Don't use complex words when simpler work
- Be specific
- Ask questions that can be easily answered
- Be sensitive to survey participants
- Exclude unrelated survey questions
- Create a library of vetted survey questions
- Use transition statements to switch topics
- Use branching/skip logic
- Don't be too concerned with survey length
- Merge institutional data
- Don't use "attention check" questions

Basic Statistics

Measures of Distribution

Frequency Distribution: Tally or count of each time a value shows up in data

Cross-Tabulation: frequency distribution with an additional grouping variable, looking at responses from two questions (ex: divided by gender)

Measures of Position

Percentiles: divide data into 100 equal sized regions, to rank responses as a percentile (82nd percentile class rank, test score, race finish position, etc.) In Excel, you can use PERCENTILE.INC(array, k) to calculate these

Deciles: divide data into 10 equal sized regions, to rank responses out of 10 (6th decile class rank)

Quartiles: divide data into 4 equal sized regions, to rank responses out of 4, useful when data has outliers, helps understand spread at a basic level (4th quartile height, GPA, etc.) In Excel, QUARTILE.INC(array, quart) to calculate these.

Interquartile Range (IQR) looks at Q2 and Q3 (the middle quartiles) to figure out the range of the middle 50% of respondents

Box and Whisker Chart can be used to show IQR and outliers.

Measures of Central Tendency

Allow us to summarize a large dataset with one representative value, helpful to compare two large datasets.

1. Mean: sum of values/divided by count of values. In Excel, AVERAGE(array) to calculate this. Also called average.
2. Median: order values lowest to highest. Median is the midpoint (or 50th percentile). For even number of values, average the two middle ones. In Excel, use MEDIAN(array) to calculate this.
3. Mode: value that occurs most frequently. Data can have no mode, single mode, or multimodal (if two or more have the same frequency). In Excel, use MODE.MULT(array) to calculate this.
4. Outliers are value that are much different or far apart from other values.

Mean is good for no outlying data. Median is good if there are outliers. Mode is great for qualitative data that mean and median cannot be performed on.

Measures of Dispersion

Data sets can have both the same mean and median, but be completely different. Dispersion helps understand and capture those differences. There are two common measures of dispersion:

1. Range: maximum value minus minimum value. In Excel, use MAX(array) - MIN(array) to calculate this.
2. Standard Deviation: Measures the spread of the bell curve. Create a bell curve by charting data points on x and y axis. The standard deviation is the value that includes 34% of values from the center of the bell curve. This means that + or - the standard deviation always includes 68% of the values. Lower standard deviations indicate less spread on the values.

This is preferred over range. On the 5-point Likert scale (strongly disagree to strongly agree), 1.2 is the typical standard deviation across the board for Likert scales so if you standard deviation is below this it indicates high agreement or low agreement if the standard deviation is higher. In Excel, use STDEV.P(array) to calculate this.

Advanced Statistics

Statistically Significant

Result not likely to have occurred by chance
p = probability that the effect was caused by chance
"Real" results are repeatable, not based on chance
Most researches set threshold for p at less than .05 or 5%
t-test is a way to compare a response to a sample or another response in another population.
Results in a t value.

Correlation versus Causation

Positive Correlation: When one variable increases, so does the other
Negative Correlation: When one variable increases, the other decreases
No Correlation: When one variable increases, the other doesn't change
Pearson Correlation Coefficient (r) measures strength and direction - measured $-1.0 < r < 1.0$.
If $r > .7$, its a strong positive correlation, $r < -.7$ is a strong negative correlation and r close to 0 means weak or no correlation
Because it is often difficult to prove causation in higher education without negative side effects so researchers rarely try to prove causation.

Four Levels of Analytics

1. Descriptive - what happened?
2. Diagnostic - why did it happen?
3. Predictive - what might happen in the future?
4. Prescriptive - how should be respond to those potential future events?

Predictive Models require:

- large datasets
- clean and complete data
- limited transferability
- lots of time and resources

3 Types of Predictive Models

1. Forecast Models: Starts with correlation trends, then adds in other known factors that will influence that
2. Decision Tree Models: Analyze data as if it were a series of decisions. With each decision, the

dataset breaks into smaller subsets to "grow" the tree. Trunk of the tree should be the strongest correlation. This can be expanded to a random forest, which is multiple decision trees each created randomly. Doing this increases the accuracy of results.

3. Linear Regression Models: estimates the linear relationship between a dependent variable and one or more independent variable. Scatter plots and trend lines.

Mutant Statistics

Mutant statistics are distorted version of a good statistic caused by poor data literacy.
Often, this looks like just a few words getting changed, accidentally or deliberately, that vastly change the meaning of the statistic.
Created in four ways:

1. generalizing statistic from a sample and applying it incorrectly to a larger population
2. interpreting a number incorrectly
3. confusing or misunderstanding meaning
4. compound errors as a statistic is passed along.

Context of Data

- Who collected it?
- Who is it about?
- How was it collected?
- What is it measuring?
- Why was it collected?
- When was it reported?

For local statistics, see your Office of Institutional Research and Effectiveness. For national statistics, see the National Center for Education Statistics.

Benchmarking Projects

- can identify strengths and weaknesses
- can track progress towards goals
- can motivate staff
- can inform decision making

Internal benchmarking (against internal goals, internal structures, and longitudinal changes [over time]) vs External benchmarking (against other institutions)

Peer Institutions: institutions you compare yourself to. Objectively, you choose institutions with similar size and programs, but there can be reasons to compare with others. Also, there is Aspirational benchmarking that looks at often larger or better funded institutions rather than peers to aspire to better and understand what is possible.

NCES offers IPEDS which is free data provided annually by all 6,500 institutions that accept and use federal financial aid.

Data Visualization

When possible, always chart your information to help your audience understand the data.

5 second rule: If it takes longer than 5 seconds to interpret the chart, it is likely readers will become frustrated and give up on understanding it.

Types of Communication/Writing

- Descriptive: Laying the facts (visualization)
- Expositive: Interpreting the facts (visualization)
- Narrative: Create a story with the facts (storytelling)
- Persuasive: Call to action (storytelling)

Making Good Line/Bar/Stacked Bar/100% Stacked Bar/Pie/Tree Map/Scatter Plot Charts:

- Simplify as much as possible. If x or y axis title is obvious, remove it (such as year). Minor tick marks are usually unnecessary. If the legend is redundant, consider removing it.
- Ideally all text in a chart should be horizontal so it is easier to read
- Sometimes, you need to select specific data to focus on, rather than charting it all
- It is often helpful to remove gridlines and add the exact values to each bar/point on the line so readers don't have to spend time estimating.
- Rather than simple chart title of "y-axis vs x-axis" consider using a narrative title that summarizes the finding of the chart.
- Put data in a meaningful order that supports the story of the data (highest to lowest, alphabetical, etc)
- Don't use unusual charts (3D charts, radar charts, spider charts
- Be careful with truncating the scale of a y-axis. Inform the reader if necessary to avoid confusion
- Don't chart incommensurate data together (data with very different scales)
- Use colors strategically (for example, color can highlight one bar you want readers to focus on)
- Use annotations (for example, on a line chart you can add notes on the chart to explain sharp changes)
- For qualitative data, try Word Clouds or # of Instances Charts instead.

Chart with Visual Impairments in Mind:

- Use a Color-Blind Friendly Pallet: Blue can be seen by almost all color-blind people. Red and green will often both look yellow. Using blue paired with any other color is a good idea.
- If you must use Red and Green together, use different shades: Print the image in grayscale to

determine if you have adequate contrast. You can also use subtle patterns on one of the colors to increase the contrast.

- Include data value and category names directly in the visualization: For example, if you put the category names directly into the sections of the pie chart, readers won't have to distinguish them in a tiny chart legend.
- Use a thick (white) border around data markers to distinguish in pie/stacked bar charts.
- Use Call Out Boxes to put line chart information directly onto the lines or use different line width and types to increase contrast
- Always add alt text to images that are important to the data story. This text allows screen readers to describe the image to low vision/blind. You can add this to charts in Word and other programs as well.

Understanding the Audience:

- Internal vs External - Are they familiar with the university, your acronyms, etc.? Note: even when you an intend a report to be internal, it could be shared externally and it is good to always keep this in mind.
- Different Information Needs - Audience could be complete Newcomers, Scientists who understand data interpretation, Enthusiasts who understand the subject matter, or Masters that have an excellent grasp on both. Provide subject information for newcomers and scientists and data literacy tips for newcomers and enthusiasts.
- Different Formats - Level 1 Reader: these people just need awareness. Provide a 5 minute summary for them. Level 2 Reader: these people are invested in the project. Consider a 2-page executive summary for them. Keep it to 10 minutes or less. Level 3 Reader: Invested people who are highly data literate. Include all information for them and don't worry about time constraints.

Data Storytelling

Our brains activate more when we hear a compelling story. Compelling stories are relatable, with a hook to grab attention. Remember, data can't speak for itself, let the natural story emerge, and allow good news to be good news without forcing conflict.

Character-Driven Data Story:
Emotionally connects the reader to a specific character (person, department, institution) facing a conflict, ending with a resolution
Freytag's Pyramid: Exposition, Rising Action, Climax, Falling Action, Conclusion

Data-Driven Data Story:
Connect the reader to the data in a storytelling fashion
Brent Dyke's Arc: Set-up & Hook, Rising Insights, Aha Moment, Solution & Next Steps

Data is presented with Executive Summaries, Presentations, or Dashboards.

Executive Summaries:

An executive summary is a short summary of a longer report that forces the researcher to identify the true data story to quickly convey information. For many who experience the data, it may be their only connection to the work.

4 Sections of an Executive Summary

1. Project Description: Mission of project, start and end dates, survey details if included, statement of quality and representativeness of data
2. Major Findings: Address the research questions: What does your audience want or need to know, context, most impactful findings, visualization
3. Recommendations: improvement actions with timeline and resources
4. Summary: High-level takeaways, address critical findings, include a summary of the recommendations/next steps from the section above

Presentations:

1. Create an Outline: Should include 4 sections same as an exec summary (Introduction, Major Findings, Recommendations, Summary/Questions)
2. Select a Theme: Excel provides all kinds of illustrations, icons, and pictures, as well as themes
3. Add Content: You can add charts and tables from Excel
4. Write a Script: Use the Speakers Notes section beneath each side to add a script that you can refer to during the presentation

Dashboards:

A visual display of the most important information needed to achieve one or more objectives, consolidated or arranged on a single screen, so the information can be monitored at a glance.

1. Strategic Dashboards: displays strategic key performance indicators (KPIs), used by senior leaders, minimal interactivity
2. Operation Dashboards: monitors operational key performance indicators (KPIs) targets against real-time data, used by business units leaders, allows some interactivity and drill downs.
3. Analytical Dashboards: highly iterative and technical, contain large amounts of historical data, and contain benchmarking data, trends, and time series, used by analysts.

Decision-Making Biases

- Sunk Cost Fallacy: You should only consider future costs and benefits. What has been invested in the past should not affect current decision making.
- Dunning-Kruger Effect: Cognitive bias where a person overestimates their skills, knowledge, and abilities on a particular subject. May make poor decisions while ignoring tutoring and advising services.

- Imposter Syndrome: Believe they know nothing about a subject but are in fact underestimating their abilities. Feelings of fraudulence, self-doubt, and inadequacy. May make poor decisions while exhausting tutoring and advising services.
- Confirmation Bias: Tendency to focus on evidence that fits existing beliefs. Can lead to poor decision making. Can lead to "group think" in group context.
- Availability Bias: Tendency to use information we can quickly recall, or is most easily available in our memories. Leads to decisions based on limited or superficial information.
- Framing Bias: Decisions are influenced by the way information is presented. The same information can be more or less attractive depending how the product is described. May choose a worse option framed in a positive light or overlook a better option that was framed in a negative light.
- Negativity Bias: Adverse or negative events have a greater impact on our decision making abilities than neutral or positive events. Linked to risk/loss aversion. Likely a natural adaptive evolutionary function that can affect decision making.
- Planning Fallacy: underestimating the time and resources needed to complete a project. To avoid this, anchor future predictions in past performance, and consider three potential obstacles/delays and add them to the estimate, and break big projects into small projects and estimate those and add them to improve overall estimate.

When we allow our Fast Thinking brain to make decisions, we can fall victim to biases. We must stop and allow our Slow Thinking brain to take over. Group decision making can also help recognize biases. You can also create a "red team" where you assign one or more people to play the role of descender.

Group Dynamics

- Social Facilitation: increased performance when working in the presence of others, especially when performing easy tasks.
- Social Inhibition: decreased performance when working in the presence of others, especially when performing difficult or new-to-you tasks
- Social Loafing: reduction in individual effort, caused by a diffusion of responsibility or no sense of being evaluated as individuals

Decision Making

Decision-Making Process:

1. Articulate the decision
2. Determine how decision will be made
3. Mitigate risk and ambiguity in the decision
4. Identify and implement solution

Step 1 - Articulate the Decision

1. Determine Level of Decision

- Strategic - who are we, long term goals, made by senior leaders or board, 5 years or longer
- Tactical - decisions made at unit level by unit leaders, 1 year time frame
- Operational - daily decisions made by every employee, should align with tactical and strategic decisions

2. Cultivate Decision Culture
   High-Performance Decision Cultures:
   - Aim high and do not settle for status quo
   - Focus on customers and competitors and ignore internal politics
   - Take ownership and responsibility for entire institution, not just unit
   - Have a bias toward action; little patience with bureaucratic debate
   - Employees are encouraged to work at their best and are rewarded
   - Embrace change and innovation; don't get bogged down

   Dysfunctional Decision Cultures:
   - Tolerate bad behavior
   - Fail to commit and stick to decisions
   - Poor management issues (micromanagement, or lack of management)
   - Paralyzed by politics (us v them, demanding consensus on decisions)

3. Identify the problem: discrepancy between current and goal values; the larger the discrepancy, the bigger the problem. How large is it? Who is affected? What harm is being caused?

Components of a Healthy Decision Culture is based on a defined strategy, strong values, good people, and excellent practice.
Espoused Values (the values on the mission statements) vs Enacted Values (the ones employees perceive as the true values based on behavior from leadership)
Focus on your circle of control, which includes your direct control and the areas you can influence.

Improving Decision Culture

- Embrace transparency
- Cultivate relationships
- Demand autonomy
- Communicate purpose
- Provide meaningful feedback
- Model the institution's values

Step 2 - Determine how decision will be made

Low Urgency, Low Impact - Democratic (one member, one vote)
Low Urgency, High Impact - Consensus (democratic, all agree)

High Urgency, Low Impact - Autocratic (one individual decides)
High Urgency, High Impact - Consultative (leader decides with others input)

Decision Making Methods

- Rational: Data-informed, highly structured, time consuming and best for complex issues; 4 step model
- Bounded Rationality: Making an acceptable decision in a limited time frame; about satisficing, not maximizing; 3 step model
- Intuitive: Arrive at a decision without conscious reasoning
- Creative: Gather information, Sit with it, Aha moment, Evaluate those aha solution options

Change Management and Assessing Impact

Step 3 - Mitigate risk and ambiguity in the decision

Impact of risk, caused by risk biases such as:

- Zero Risk Bias: Want absolute certainty and eliminate all risk, therefore missing out on still low-risk high-reward opportunity
- Loss Aversion: Hating to lose, regardless of the cost to avoid it, I.E. paying for expensive
- Risk Aversion: Preference for certainty over gambling for a better outcome. People become more risk averse as they age.
- Regret Aversion: If I don't do this today, I'll regret it in the future. Causes people to think less about making good decisions than avoiding bad ones. I.E. fear of missing out. Live in present and accept all outcomes to counter this.
- Overconfidence Bias: overestimating your abilities, can cause institutions/people to overextend
- Illusion of Control: needing to feel like your in control, even when you aren't. Can cause people to blame or credit themselves in instances where they had no control.
- Optimism Bias: overestimating chance of positive experiences, underestimating negative experiences. Can cause miscalculations in schedule and cost for projects. Find objective data to anchor your judgement to avoid this.

Impact of ambiguity:
Ambiguity Effect is avoiding solutions that we consider to be ambiguous or lacking information.
Diffusion of Innovation Theory follows a bell curve for how people adopt a new innovation.

Consider the number of outcomes for a decision. If one or two, you may be able to proceed autocratically. If several, it may be best to gather information to hone in on possible outcomes and reduce the ambiguity. If you have no idea on outcome, make small decisions and assess after each to better understand outcome for the larger change.

Make decisions in a group (small, diverse groups are better as well as collecting their opinions

independently and anonymously).

Step 4 - Identify and implement solution
Create an Ease of Implementation Heatmap: ease of implementation on the y-axis, impact on student success on the x-axis, then order the actions you will take based on where they fall on the map. Actions with high impact, low difficult should be done first, followed by medium impact, medium difficulty. Low impact and high difficulty should be avoided.

Completing a project:

1. Organize -
    1. Choose a project manager.
    2. Have them develop a project implementation plan (description, intended results, list of constraints, list of assumptions).
    3. Identify the project scope (break down into tasks and subtasks).
    4. Assign tasks to team members.
    5. Develop a timeline and resource budget.
    6. Develop communications plan (to inform observers about project timeline and get sponsorship from champions).
2. Execute - Project manager should assure quality, manage team, develop team skills/ knowledge, compare performance with plans, fix problems, communicate with stakeholders.
3. Complete - Get approval by project owner and hold a post-project evaluation. Hold a meeting between implementation team and project owner. Announce completion of project publicly.

Change Management: Helping people to accept and manage the changes implemented through decisions-making.

The Change Curve:

- Stage 1 - Shock and Denial
- Stage 2 - Anger and Depression
- Stage 3 - Acceptance and Integration

People move through the curve at different speeds and with different intensities. Integration adopts the change as a new habit.

Fuel vs Friction (driving a car metaphor):
Know when to stop adding fuel and to start reducing friction to move forward. To address friction, stop focusing on the problem you are solving and start focusing on the people impacted.

Four Forces of Friction:

1. Path of Least Resistance: find an easy path for people to implement the change

2. Path of Least Emotional Resistance: avoid change that is emotional
3. Inertia: resistance to change/wanting to maintain status quo.
4. Reactance: act of pushing back on anything new

Successful people are experts at building good habits and eliminating bad habits.

Forming Good Habits:

1. Reduce the friction by making the new habit easy and fun.
2. Add a reward. Needs to be immediate to reinforce.
3. Piggyback or habit-stack. Do something immediately following an existing habit.
4. Practice consistency. Don't skip early on.

Breaking Bad Habits

1. Add friction to the habit to make it harder to do or less appealing. Friction can be anything that forces you to consciously acknowledge the habit.