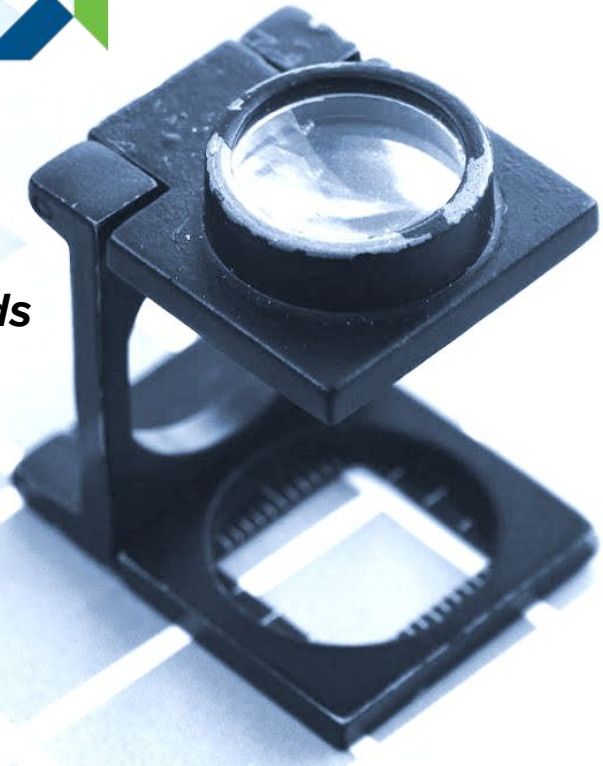
The Learning Accelerator

# Teacher Creativity Survey Pilot

## *Descriptive Observations & Trends*

**September 14, 2022**

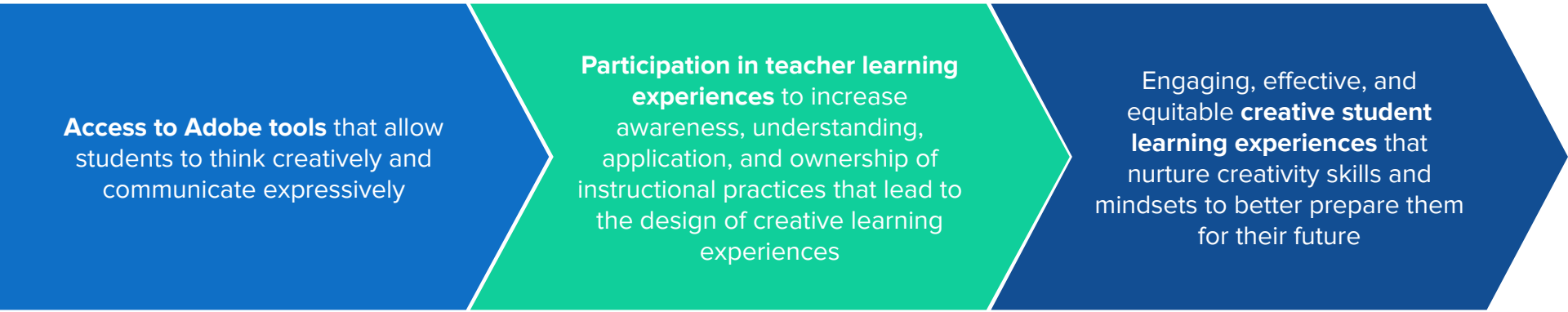


BL BetterLesson®

# Research Opportunity

Currently, a disconnect exists between the demand for creativity in the workplace and how students are provided with opportunities to develop creativity skills — this disconnect is even more stark in schools that serve global majority students who live in low-income communities leading to not only a digital divide but also an opportunity divide. While teachers have expressed the desire to learn how to foster creativity, they do not always know how to factor it into instructional design or have access to the tools and professional learning to make it a reality.

***How might partnering with Adobe, BetterLesson, and TLA tackle this challenge?***



# Operational Definition of Creativity

*Creativity is the competence to leverage self-interests, motivation, imagination, and prior knowledge in flexible ways*[1] *to generate, evaluate, or improve ideas; imagine new ways of solving problems;*[2] *forge new connections — across content and people;*[3] *create new understanding; or communicate thinking through writing, drawing, voice, music, or any other means of expression.*[4]

# Research Big Picture: Purpose

The Purpose of this study is to **measure the effect** of providing districts with **access to creative tools** — for both teachers and students — as well as **high-quality professional learning** to develop educator skills, capacities, and mindsets to design learning experiences that foster student creativity skills.

# Research Big Picture: *Objectives*

1. Examine the effects of active participation in professional learning on **educators' beliefs, mindsets, and understanding about fostering student creativity**;
2. **Understand students' perceptions** about their participation in learning opportunities designed to foster creativity;
3. Examine the effects of engaging in creative learning opportunities on the **development of students' creativity, critical thinking, and creative communication skills**;
4. **Identify instructional strategies and practices** that lead to the design and implementation of student creativity, critical thinking, and creative communication skills; and
5. **Understand the system conditions** required to support educators in the design and implementation of learning experiences that foster student creativity.

# **Project Phase 1 -** Design & Pilot a Survey to Understand Teachers' Perceptions and Behaviors Around Creativity

# Teacher Creativity Survey Overview

To measure *creativity*, we broke the overarching theory into separate constructs — broad concepts or factors — based on our analysis of the research literature. We started with the broad ideas of *creative thinking*, *innovation*, and *computing creativity (*creativity specific to technology) before breaking them down into the constructs below.

| Construct | Definition |
|---|---|
| **Creative Personality & Curiosity:** | A lifestyle, a personality trait, wanting to see, hear, know, experience something new, original, unknown. |
| **Knowledge & Skills Expansion:** | Stimulating creativity means learning new things outside the current areas of knowledge. It means having the capacity for great achievements, including verbal and linguistic creativity. |
| **Connection:** | To be able to make connections with things that have no apparent connection. |
| **Boldness:** | To be able to overcome boundaries of accepted conventions and to not be afraid to make mistakes. |
| **Originality:** | To be able to produce unique or unusual ideas. |
| **Fluency:** | To be able to generate many ideas to evaluate, research, and choose different solutions to a problem. |
| **Flexibility:** | To be able to produce ideas that show a diversity of possibilities, through different points of view or domains of thought. |
| **Elaboration:** | To take care of details, beautifying, and completing something creative to make something real, understandable, or aesthetically pleasing. |

# Creativity Domains & Constructs

The different constructs map onto two domains: **Perceptions** and **Behaviors**.

Some constructs appeared in both domains. In those instances, we could make observations between the two even though they were measured using two different scales.

| Domain | Construct | Scale |
|---|---|---|
| **Attitudes toward Creativity in Learning (Perception)** | Boldness, Connection, Creative Personality & Curiosity, Originality | *1 = Strongly Disagree*<br>*2 = Disagree*<br>*3 = Agree*<br>*4 = Strongly Agree* |
| **Teaching for Creativity (Behavioral)** | Connection, Creative Personality & Curiosity, Elaboration, Flexibility, Fluency, Originality | *1 = Not at all true of me*<br>*2 = Somewhat true of me*<br>*3 = True of me*<br>*4 = Very much true of me* |

# Survey Dissemination

The Teacher Creativity Survey intended to measure teachers' knowledge, perceptions, and practices around creativity. During this initial pilot phase, the goal was to have as many classroom teachers of students in grades 6-10 as possible to complete the survey so that the TLA research team could assess the reliability (analysis of Cronbach's alpha) and validity (exploratory factor analysis) of the instrument. To run these statistical tests, the team needed a MINIMUM of 250 responses.

In addition to sending the survey link to all subscribers of the TLA and BetterLesson newsletters, direct outreach occurred to the following groups:

- Future Ready
- MA DESE Superintendents
- Johns Hopkins EdD 2015 & 2017 Cohorts
- Harvard Graduate School of Education Alumni
- Remote DEI Collective
- Teach for America Staff & Former Staff
- TLA Strategy Lab Members
- TLA Innovative Directors' Network
- Transcend Design Community
- What Schools Could Be
- Verizon Innovative Learning Schools

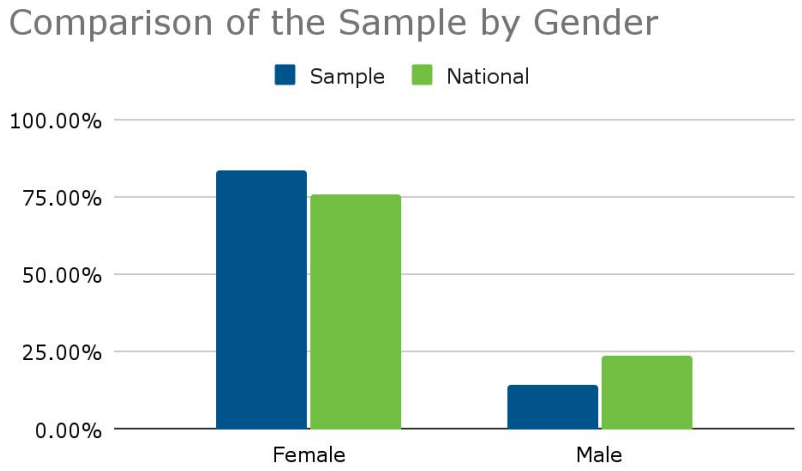
# Survey Respondent Demographics

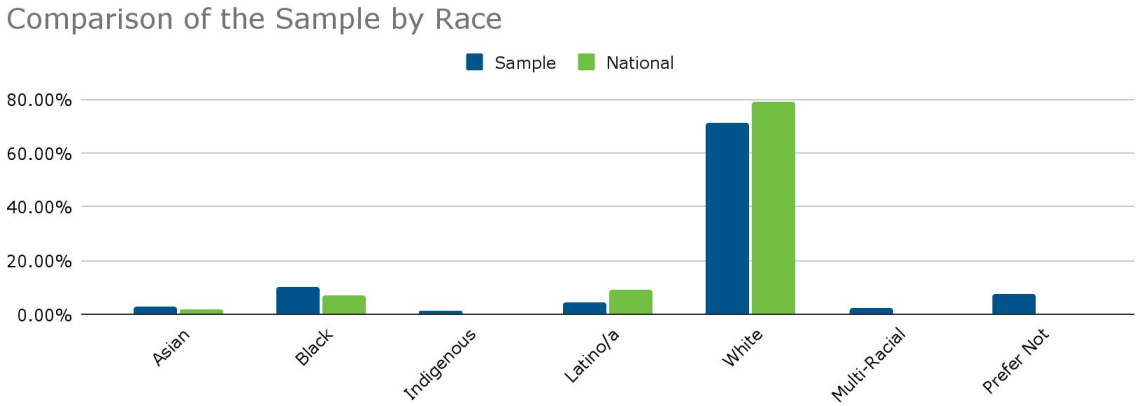
# Sample Composition

After collecting a total of 712 responses, the research team removed incomplete entries as well as those that did not match the target demographics (i.e., outside the U.S. or not a classroom teacher) for a **final sample of 455**.

Respondents from 47 states, including the District of Columbia, completed the survey with California (n=33), Illinois (n=23), Massachusetts (n=42), New York (n=34), and North Carolina (n=55) **accounting for 41% of the sample**.

When compared to national statistics,[5] the **demographics somewhat aligned with the broader population of public school educators.**



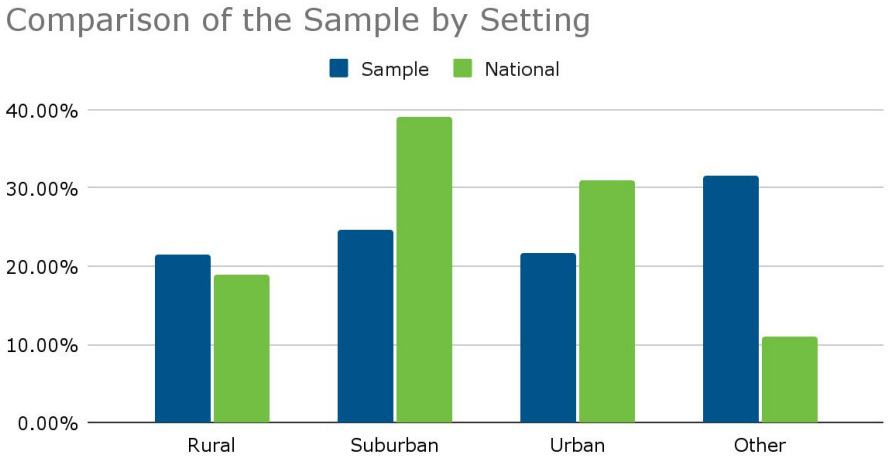
# Sample Demographics

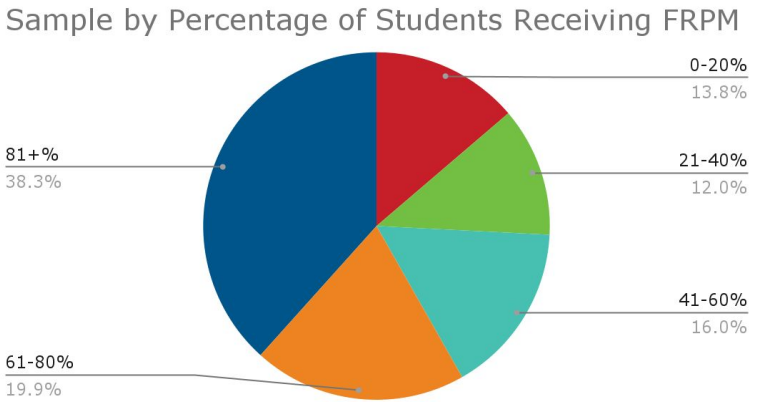
Respondents indicated that they worked in a variety of settings from rural to urban. The *other* category on the survey included rural-urban, rural-suburban, and suburban-urban. Nationally, this category is referred to as *town*.

According to the National Center for Education Statistics,[6] approximately 52% of public school students qualified for Free or Reduced Price Meals (FRPM). Within the sample, **the majority of respondents indicated that at least 60% of their students received these services**.

Approximately **35% of the respondents indicated that over 60% of their students identify as an underrepresented race** within their school (i.e., African American/Black, American Indian, Alaskan Native, Asian, or Latino/a).

Finally, **67.25% of the responding teachers indicated that they have 11+ years of classroom experience**, largely mirroring national trends.

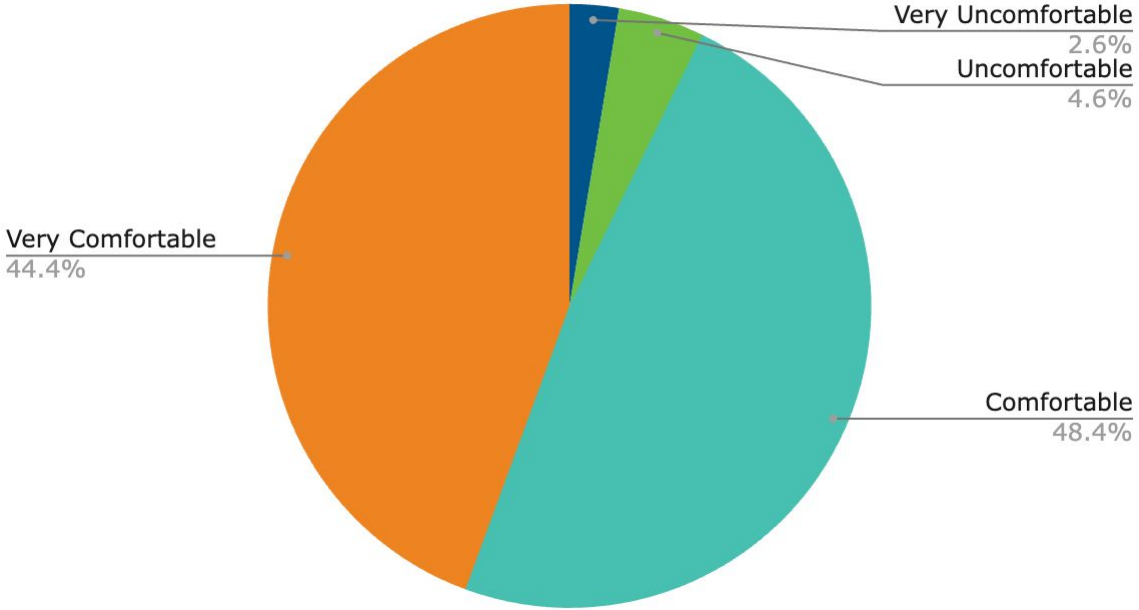


# Teachers' Comfort Level with Teaching with Technology

Since the start of the pandemic, educators across the country have reported increased comfort and skill with technology. An EdWeek Research Center study noted that 46-49% of survey respondents felt as though their ability to use technology had *improved a lot*. In Spring 2021, a survey from the Christensen Institute found that 72% of respondents felt confident in their ability to use online tools.

In contrast, within the sample who responded to the Teacher Creativity Survey, 92.8% indicated that they were ***comfortable*** or ***very comfortable*** teaching with technology.

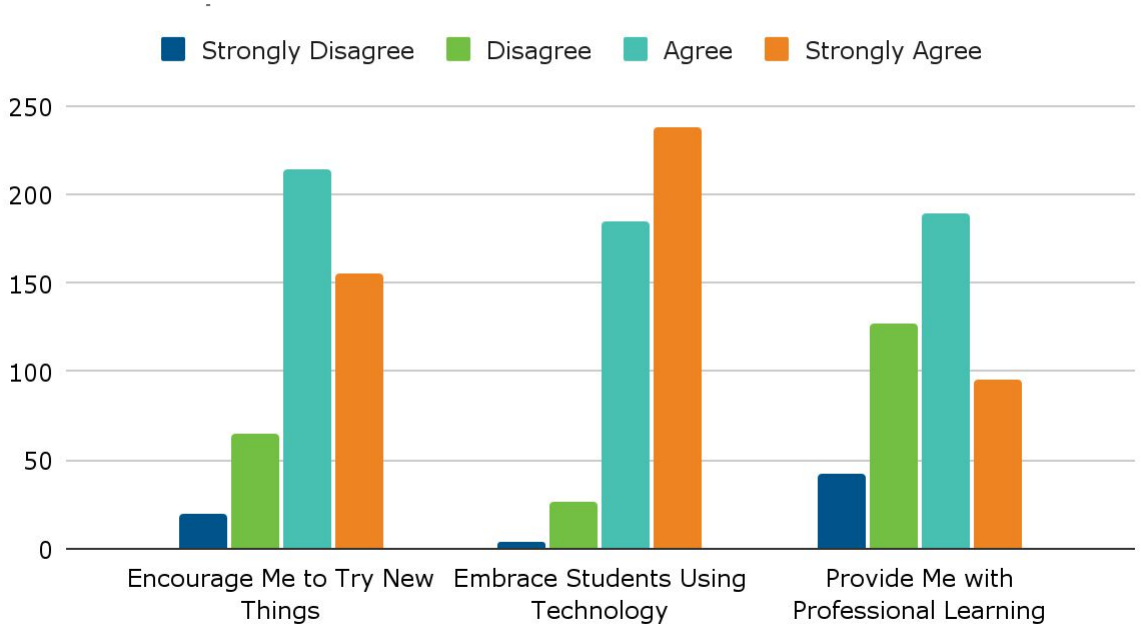


# Leadership Conditions to Support Creative Learning

Using questions from the Gallup State of Creativity Survey, participants responded to the following questions about the leadership conditions in their school.

1. Leaders at my school **encourage me to try new things** with my lesson plans.
2. Leaders at my school **embrace students using technology** in the classroom.
3. Leaders at my school **provide me with professional learning** to help design classroom experiences that encourage student creativity.

Notably, participants indicated far less agreement around whether their leaders provide them with professional learning to help design classroom experiences that encourage student creativity. This indicates a potential area for future exploration.



# Data Analysis Process

We completed the process below to analyze the data from the survey:

1. Conducted an Exploratory Factor Analysis (EFA) to determine how many factors might be represented in the data structure. This was the first step towards determining whether the survey might be statistically valid.
2. Examined the internal consistency and reliability for each of the seven scales by conducting an analysis of Cronbach's alpha.
3. Built correlation matrices (Pearson's Correlation) to examine the relationship between each of the survey items associated with each construct.
4. Completed a descriptive analysis of each survey item (mean, median, and standard deviation).
5. Examined the frequency tables and modeled the data within each construct to look for trends.

# Limitations

With this first pilot, our goal was to test the survey with a heterogeneous sample of educators from across the country so that we could understand whether it will be a reliable and valid measure to help the field understand teachers' perceptions and practices around creativity.

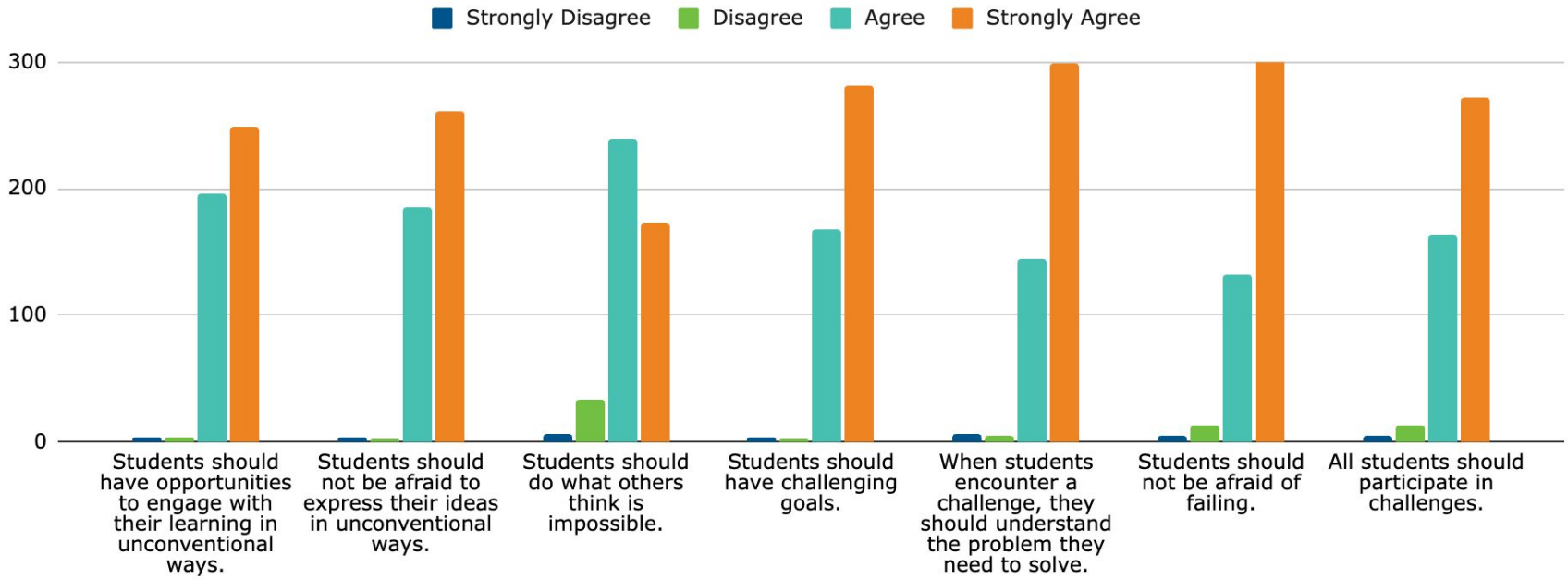
The findings presented on the following slides are our observations from the data.

# Analysis by Construct

# Boldness (Perception)

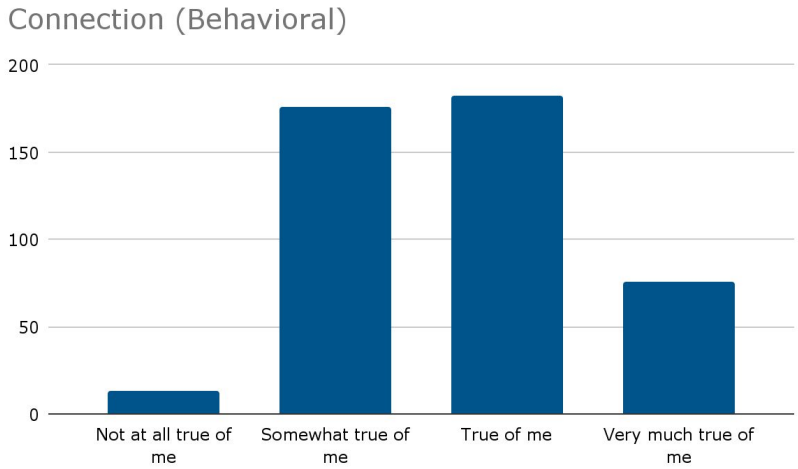
*To be able to overcome boundaries of accepted conventions and to not be afraid to make mistakes.*

Of note, the highest level of disagreement was associated with the question about whether students should *do what others think is impossible*.

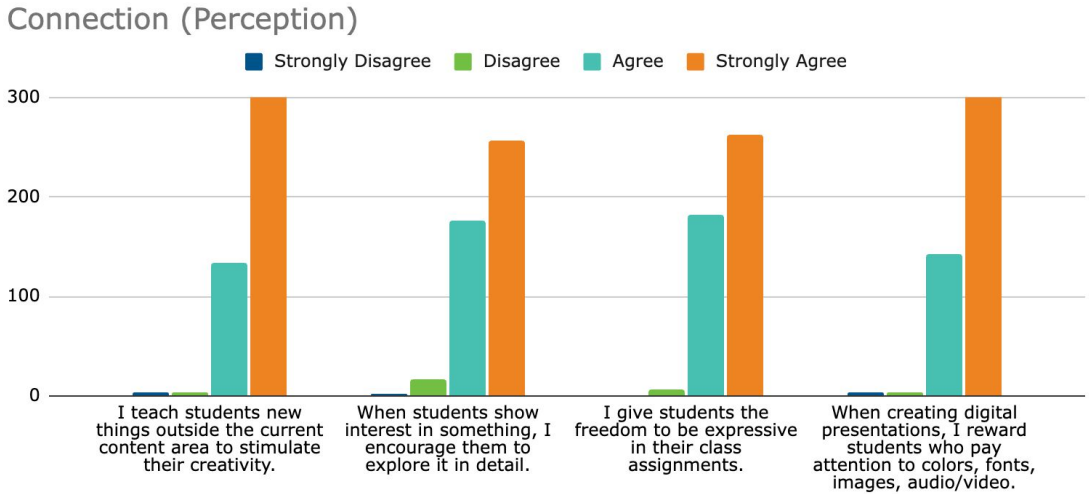


# Connection (Perception & Behavioral)

*To be able to make connections with things that have no apparent connection.*



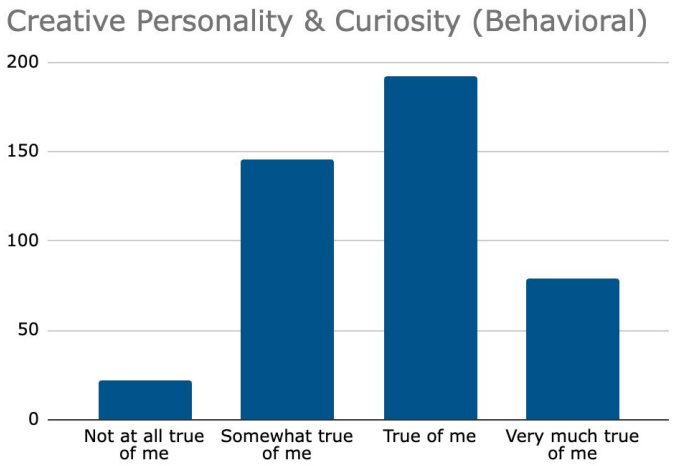

Where the perception data skewed heavily towards *strongly agree*, the question asking, ***"I teach students new things outside the current content area to stimulate their creativity,"*** indicated that fewer teachers demonstrated this practice.

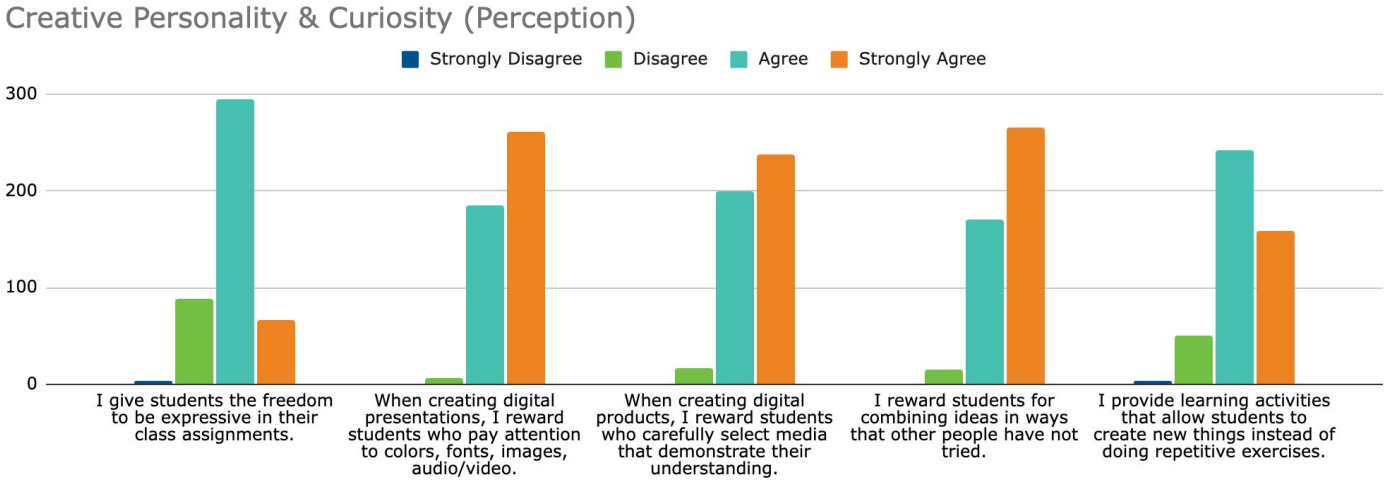


# Creative Personality & Curiosity (Perception & Behavioral)

*A lifestyle, a personality trait, wanting to see, hear, know, experience something new, original, unknown.*

Of note, the first item, ***"I give students the freedom to be expressive in their class assignments,"*** had the lowest level of agreement and was the least correlated with the other items in this construct (see Appendix)



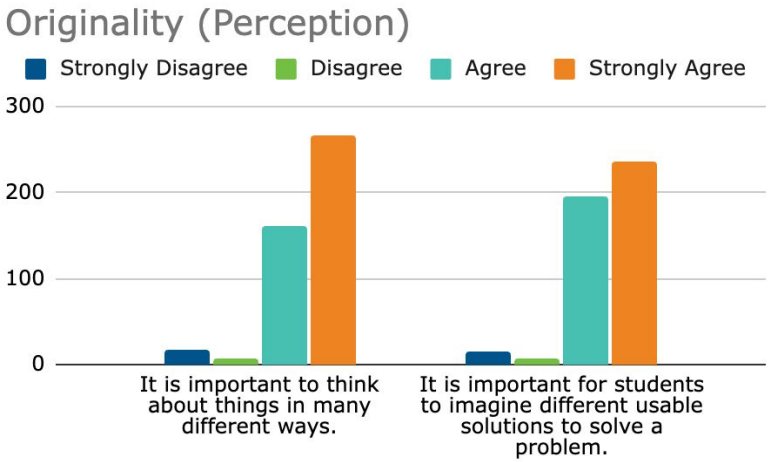



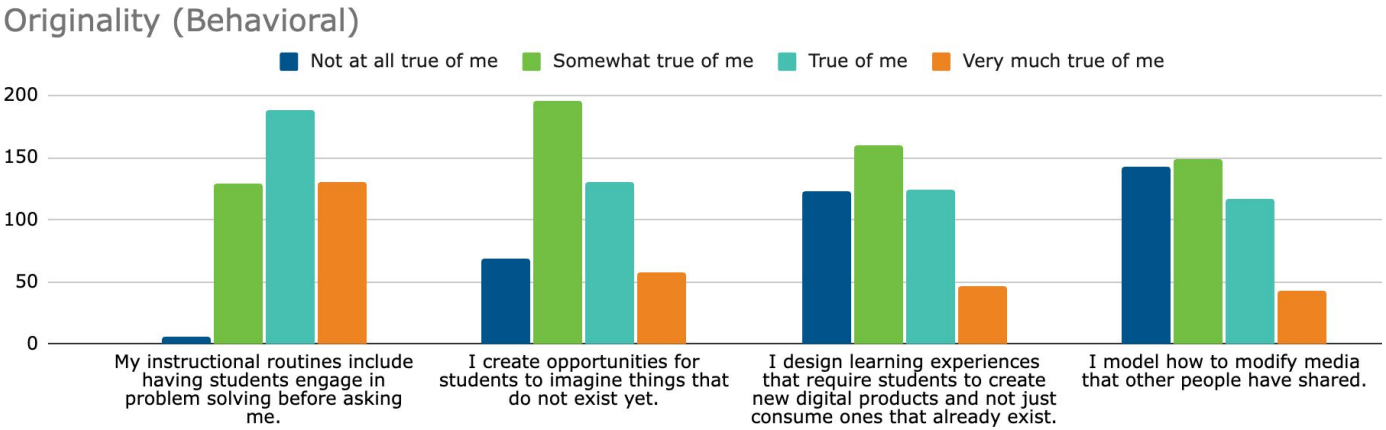
# Originality (Perception & Behavioral)

*To be able to produce unique or unusual ideas.*

This construct further illustrates the observed differences between teacher perceptions and their reported behaviors.

Teachers *strongly agree* that it is important for ***students to think creatively*** and ***imagine different solutions*** but do not indicate that they demonstrate practices that would foster that creativity with as much regularity.

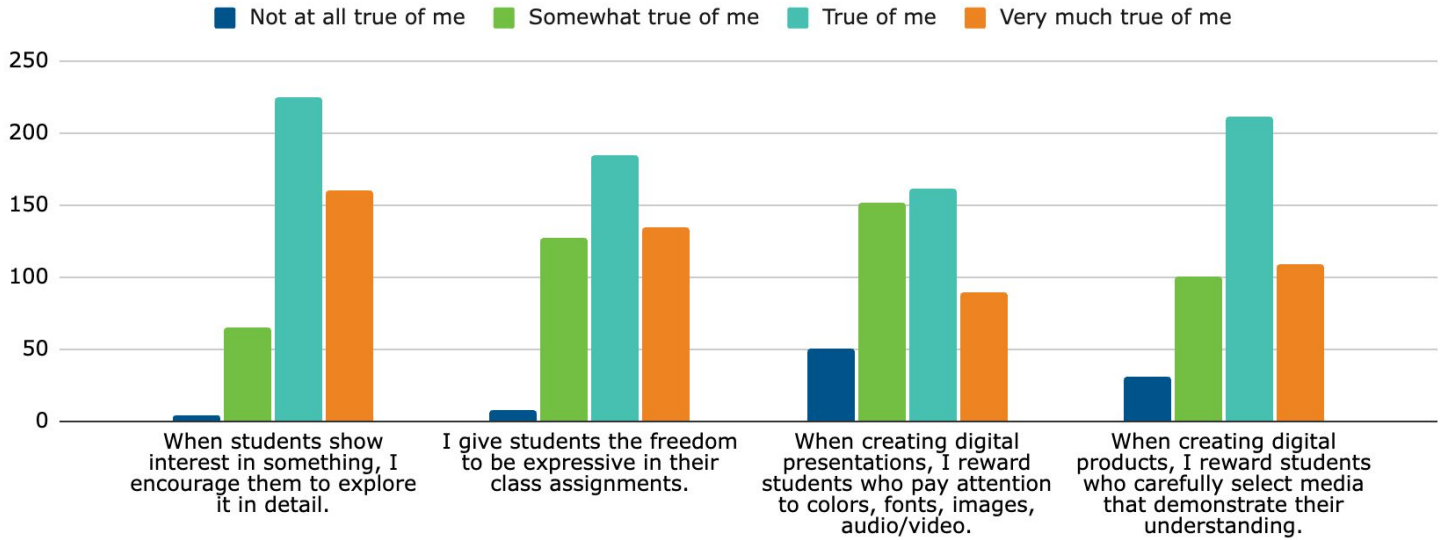


# Elaboration (Behavioral)

*To take care of details, beautifying, and completing something creative to make something real, understandable, or aesthetically pleasing.*

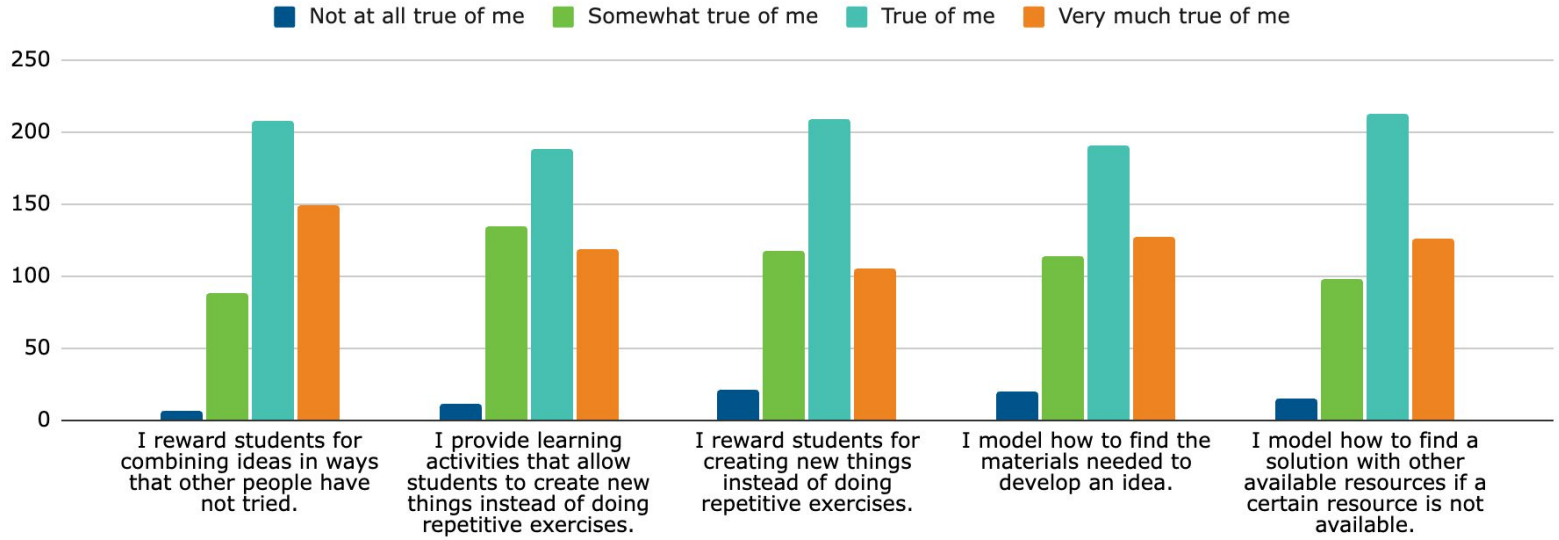
Although the data continues to trend towards the positive, there's a notable distinction. The first two variables are more subjective and the second implies that teachers give students concrete creative opportunities.



# Flexibility (Behavioral)

*To be able to produce ideas that show a diversity of possibilities, through different points of view or domains of thought.*

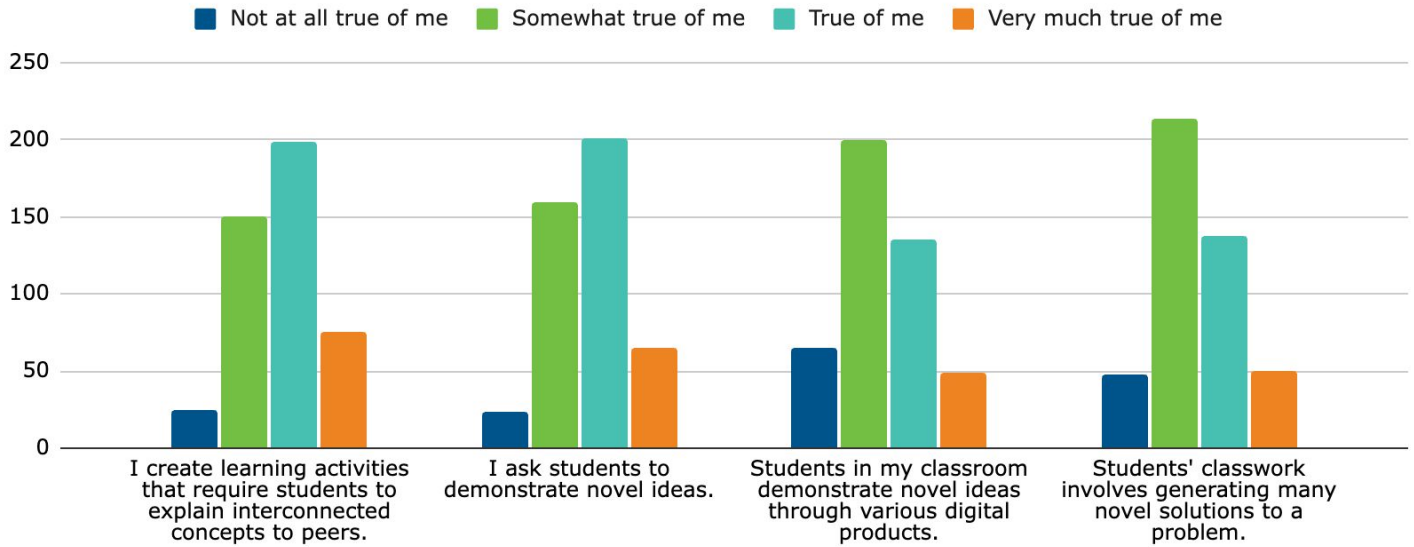
The third variable, "***I reward students for creating new things instead of doing repetitive exercises***," had the lowest mean score (M=2.88, SD=0.815), mirroring the variables that include the word ***reward*** from the Elaboration construct. This could imply that while teacher perceptions of creativity were largely positive, they may not be rewarding creative behaviors in students as regularly.



# Fluency (Behavioral)

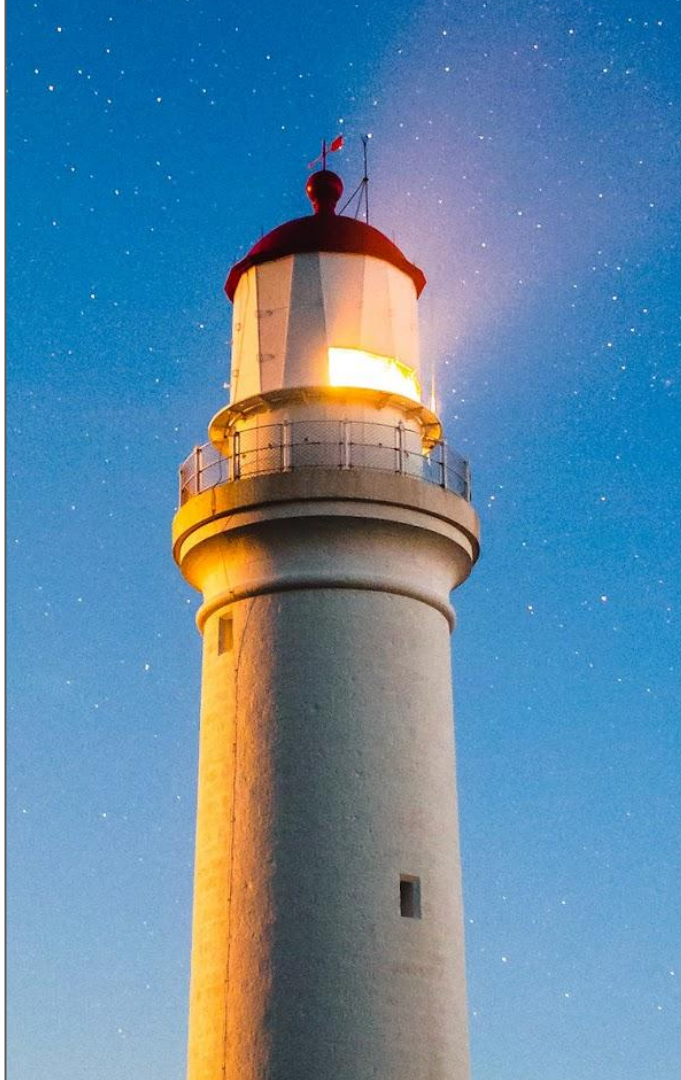
*To be able to generate many ideas to evaluate, research, and choose different solutions to a problem.*

This construct had some of the lowest mean scores, particularly with variables three and four. Of note, these two variables, ***students demonstrate novel ideas*** (M=2.37, SD=0.862) and ***students' classwork involves generating novel solutions*** (M=2.42, SD=0.826), imply that teachers have created opportunities for students to demonstrate their creativity skills.



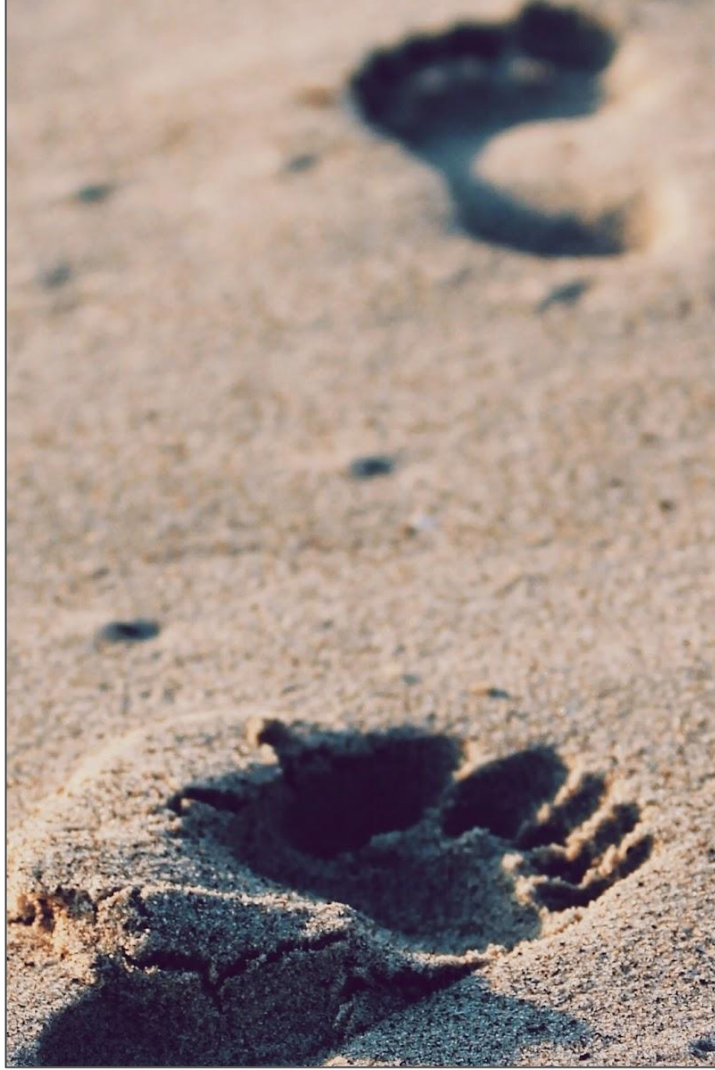
# Key Takeaways

- Analysis of the leadership questions indicates that while the majority of teachers in the sample feel supported, they reported that they **have not received adequate professional learning to design classroom experiences that enhance student creativity.** This serves as one indication of the need for a program such as this collaborative project.
- Across constructs, results indicate that **while teachers value creativity (perception), they do not always demonstrate practices that would foster it in the classroom (behavioral)**. This should be further examined in future phases of the project.
- Notably, **survey items asking about what students DO had some of the lowest mean scores,** implying that teachers may not be designing classroom activities that allow students to demonstrate their creativity or engage in creative tasks.



# Next Steps

- Based on the analysis, we have revised the Teacher Creativity Survey and will make it available for other schools and systems to use. This tool intends to help teachers and leaders understand potential areas for improvement and new opportunities to further engage students in creative endeavors.
- Once enough data has been collected with the revised Teacher Creativity Survey, we will conduct a Confirmatory Factor Analysis (CFA) to assess its reliability and repeat our reliability analysis.
- The next phase of the project is to design and test a student survey to understand their knowledge, perceptions, and practices around creativity.



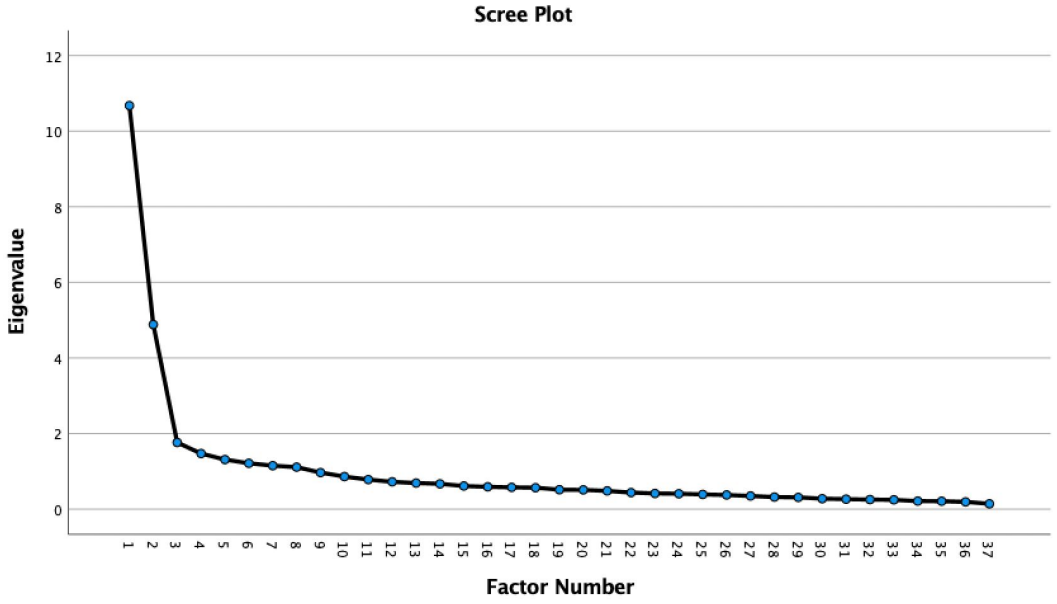
# Appendix A - Survey Assessment

# Exploratory Factor Analysis

We conducted an Exploratory Factor Analysis (EFA) to determine how many factors might be represented in the data structure using an oblique rotation. To decide how many factors to retain, we examined eigenvalues greater than 1.0 and reviewed the scree plot. Further, we examined the factor loadings greater than or equal to 0.30.

Analysis identified eight eigenvalues above 1.0. However, only two factors explain a significant proportion of the variance (42%), and the scree plot suggested two factors.

Because the emergent structure did not represent the original measure, we are revising items and reorganizing by the *Four Ps Framework*:[1] Person, Press, Process, and Product. Next steps will include cognitive interviews and a Confirmatory Factor Analysis (CFA) with the revised instrument.



# Internal Consistency & Reliability

We examined the internal consistency and reliability for each of the seven scales by conducting an analysis of Cronbach's alpha. We also examined reliability at the scale level to build evidence for subscore or scale-level reporting and recommendations. As shown in the table, all seven scales exhibited sufficient internal consistency reliability. The alpha coefficients ranged from .71 to .89. However, given the EFA results, we will not retain this assumed factor structure and will need to reassess with the revised instrument.

| Scale | N | Alpha Coefficient |
|---|---|---|
| Boldness | 447 | .86 |
| Connection | 441 | .71 |
| Creativity | 433 | .71 |
| Originality | 450 | .72 |
| Elaboration | 450 | .73 |
| Fluency | 446 | .89 |
| Flexibility | 447 | .84 |

# Appendix B - Correlation Matrices

# Boldness (Perception)

A Pearson correlation coefficient assessed the linear relationship between the seven variables. There was a positive correlation with r-values in the acceptable range (0.3-0.9) and p<.001.

| Perception Items | | BOL001 | BOL002 | BOL003 | BOL004 | BOL005 | BOL006 | BOL007 |
|---|---|---|---|---|---|---|---|---|
| **BOL001** | Pearson's r | — | | | | | | |
| | p-value | — | | | | | | |
| **BOL002** | Pearson's r | 0.676 | — | | | | | |
| | p-value | < .001 | — | | | | | |
| **BOL003** | Pearson's r | 0.551 | 0.505 | — | | | | |
| | p-value | < .001 | < .001 | — | | | | |
| **BOL004** | Pearson's r | 0.461 | 0.451 | 0.524 | — | | | |
| | p-value | < .001 | < .001 | < .001 | — | | | |
| **BOL005** | Pearson's r | 0.487 | 0.437 | 0.429 | 0.633 | — | | |
| | p-value | < .001 | < .001 | < .001 | < .001 | — | | |
| **BOL006** | Pearson's r | 0.458 | 0.44 | 0.471 | 0.54 | 0.593 | — | |
| | p-value | < .001 | < .001 | < .001 | < .001 | < .001 | — | |
| **BOL007** | Pearson's r | 0.353 | 0.363 | 0.386 | 0.553 | 0.498 | 0.509 | — |
| | p-value | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 | — |

# Connection (Perception & Behavioral)

A Pearson correlation coefficient assessed the linear relationship between the four variables within the Perception Domain for Connection. There was a positive correlation with r-values in the acceptable range (0.3-0.9) and p<.001.

Because there was only one survey item related to Connection within the Behavioral domain, an analysis was not conducted.

| Perception Items | | CON001 | CON002 | CON003 | CON004 |
|---|---|---|---|---|---|
| **CON001** | Pearson's r | — | | | |
| | p-value | — | | | |
| **CON002** | Pearson's r | 0.462 | — | | |
| | p-value | < .001 | — | | |
| **CON003** | Pearson's r | 0.414 | 0.538 | — | |
| | p-value | < .001 | < .001 | — | |
| **CON004** | Pearson's r | 0.487 | 0.58 | 0.56 | — |
| | p-value | < .001 | < .001 | < .001 | — |

# Creative Personality & Curiosity (Perception & Behavioral)

A Pearson correlation coefficient assessed the linear relationship between the five variables. While there was a positive relationship between the survey items, not all of the r-values fell within in the acceptable range (0.3-0.9) and p<.001. Of note, the item, ***"I give students the freedom to be expressive in their class assignments,"*** did not appear as strongly related to the other three.

Because there was only one survey item related to Creative Personality & Curiosity within the Behavioral domain, an analysis was not conducted.

| Perception Items | | CRE001 | CRE002 | CRE003 | CRE004 | CRE005 |
|---|---|---|---|---|---|---|
| CRE001 | Pearson's r | — | | | | |
| | p-value | — | | | | |
| CRE002 | Pearson's r | 0.297 | — | | | |
| | p-value | < .001 | — | | | |
| CRE003 | Pearson's r | 0.296 | 0.488 | — | | |
| | p-value | < .001 | < .001 | — | | |
| CRE004 | Pearson's r | 0.263 | 0.334 | 0.443 | — | |
| | p-value | < .001 | < .001 | < .001 | — | |
| CRE005 | Pearson's r | 0.249 | 0.278 | 0.385 | 0.501 | — |
| | p-value | < .001 | < .001 | < .001 | < .001 | — |

# Originality (Perception & Behavioral)

A Pearson correlation coefficient assessed the linear relationship between the variables within each domain. There was a strong positive correlation between the two Perception items: ***"It is important to think about things in many different ways"*** and ***"It is important for students to imagine different usable solutions to solve a problem"*** ($r = 0.701$, $p<.001$). There was a positive correlation with r-values in the acceptable range (0.3-0.9) and $p<.001$ for the four Behavioral variables.

| Perception Items | | ORI001 | ORI002 |
|---|---|---|---|
| ORI001 | Pearson's r | — | |
| | p-value | — | |
| ORI002 | Pearson's r | 0.701 | — |
| | p-value | < .001 | — |

| Behavioral Items | | ORI003 | ORI004 | ORI005 | ORI006 |
|---|---|---|---|---|---|
| ORI003 | Pearson's r | — | | | |
| | p-value | — | | | |
| ORI004 | Pearson's r | 0.448 | — | | |
| | p-value | < .001 | — | | |
| ORI005 | Pearson's r | 0.342 | 0.603 | — | |
| | p-value | < .001 | < .001 | — | |
| ORI006 | Pearson's r | 0.238 | 0.451 | 0.574 | — |
| | p-value | < .001 | < .001 | < .001 | — |

# Elaboration (Behavioral)

A Pearson correlation coefficient assessed the linear relationship between the four variables. There was a positive correlation between the items. The r-values fell within the acceptable range (0.3-0.9) and p<.001 with two exceptions. The first variable, "***When students show interest in something, I encourage them to explore it in detail,"*** did not correlate as well with either the third variable, "***When creating digital presentations, I reward students who pay attention to colors, fonts, images, audio/video,"*** or the fourth, "***When creating digital presentations, I reward students who pay attention to colors, fonts, images, audio/video.***"

The Exploratory Factor Analysis indicated that these items loaded onto different factors.

| Behavioral Items | | ELB001 | ELB002 | ELB003 | ELB004 |
|---|---|---|---|---|---|
| ELB001 | Pearson's r | — | | | |
| | p-value | — | | | |
| ELB002 | Pearson's r | 0.494 | — | | |
| | p-value | < .001 | — | | |
| ELB003 | Pearson's r | 0.266 | 0.372 | — | |
| | p-value | < .001 | < .001 | — | |
| ELB004 | Pearson's r | 0.287 | 0.361 | 0.662 | — |
| | p-value | < .001 | < .001 | < .001 | — |

# Flexibility (Behavioral)

A Pearson correlation coefficient assessed the linear relationship between the five variables. There was a positive correlation with r-values in the acceptable range (0.3-0.9) and p<.001.

| Behavioral Items | | FLX001 | FLX002 | FLX003 | FLX004 | FLX005 |
|---|---|---|---|---|---|---|
| FLX001 | Pearson's r | — | | | | |
| | p-value | — | | | | |
| FLX002 | Pearson's r | 0.429 | — | | | |
| | p-value | < .001 | — | | | |
| FLX003 | Pearson's r | 0.549 | 0.638 | — | | |
| | p-value | < .001 | < .001 | — | | |
| FLX004 | Pearson's r | 0.384 | 0.522 | 0.467 | — | |
| | p-value | < .001 | < .001 | < .001 | — | |
| FLX005 | Pearson's r | 0.391 | 0.475 | 0.471 | 0.814 | — |
| | p-value | < .001 | < .001 | < .001 | < .001 | — |

# Fluency (Behavioral)

A Pearson correlation coefficient assessed the linear relationship between the four variables. There was a positive correlation with r-values in the acceptable range (0.3-0.9) and p<.001. Of note, the variables in this construct had some of the highest correlations, indicating a strong relationship.

| Behavioral Items | | FLC001 | FLC002 | FLC003 | FLC004 |
|---|---|---|---|---|---|
| FLC001 | Pearson's r | — | | | |
| | p-value | — | | | |
| FLC002 | Pearson's r | 0.674 | — | | |
| | p-value | < .001 | — | | |
| FLC003 | Pearson's r | 0.55 | 0.645 | — | |
| | p-value | < .001 | < .001 | — | |
| FLC004 | Pearson's r | 0.605 | 0.694 | 0.709 | — |
| | p-value | < .001 | < .001 | < .001 | — |

# Appendix C - Descriptive Analysis

# Boldness (Perception)

| Perception Survey Items | Students should have opportunities to engage with their learning in unconventional ways. | Students should not be afraid to express their ideas in unconventional ways. | Students should do what others think is impossible. | Students should have challenging goals. | When students encounter a challenge, they should understand the problem they need to solve. | Students should not be afraid of failing. | All students should participate in challenges. |
|---|---|---|---|---|---|---|---|
| N | 453 | 453 | 452 | 454 | 455 | 454 | 454 |
| Missing | 2 | 2 | 3 | 1 | 0 | 1 | 1 |
| Mean | 3.52 | 3.55 | 3.28 | 3.6 | 3.62 | 3.62 | 3.55 |
| Median | 4 | 4 | 3 | 4 | 4 | 4 | 4 |
| Standard deviation | 0.566 | 0.561 | 0.664 | 0.55 | 0.581 | 0.6 | 0.61 |

# Connection (Perception & Behavioral)

| Perception Survey Items | Students should find the connection between academic content and real-world applications. | When students have a difficult problem, they should understand the problem to be solved. | Students should pay attention to other people's ideas. | Students should create new solutions by building off of their prior knowledge. |
|---|---|---|---|---|
| N | 454 | 451 | 452 | 454 |
| Missing | 1 | 4 | 3 | 1 |
| Mean | 3.67 | 3.52 | 3.56 | 3.65 |
| Median | 4 | 4 | 4 | 4 |
| Standard deviation | 0.537 | 0.594 | 0.54 | 0.529 |

| Behavioral Survey Item | I teach students new things outside the current content area to stimulate their creativity. |
|---|---|
| N | 447 |
| Missing | 8 |
| Mean | 2.72 |
| Median | 3 |
| Standard deviation | 0.776 |

# Creative Personality & Curiosity (Perception & Behavioral)

| Perception Survey Items | Creativity can be taught. | Creative people make positive contributions to the lives of others. | Stimulating one's creativity involves learning new things outside one's current areas of knowledge. | It is important for students' learning to make meaningful contributions beyond their classroom. | It is important for students to have opportunities to create digital products that are meaningful to them. |
|---|---|---|---|---|---|
| N | 454 | 453 | 454 | 454 | 454 |
| Missing | 1 | 2 | 1 | 1 | 1 |
| Mean | 2.94 | 3.56 | 3.48 | 3.55 | 3.23 |
| Median | 3 | 4 | 4 | 4 | 3 |
| Standard deviation | 0.611 | 0.527 | 0.582 | 0.576 | 0.661 |

| Behavioral Survey Item | I provide opportunities for students to create products that are meaningful to them. |
|---|---|
| N | 439 |
| Missing | 16 |
| Mean | 2.875 |
| Median | 3 |
| Standard deviation | 0.807 |

# Originality (Perception & Behavioral)

| Perception Survey Items | It is important to think about things in many different ways. | It is important for students to imagine different usable solutions to solve a problem. |
|---|---|---|
| N | 453 | 454 |
| Missing | 2 | 1 |
| Mean | 3.49 | 3.43 |
| Median | 4 | 4 |
| Standard deviation | 0.721 | 0.699 |

| Behavioral Survey Items | My instructional routines include having students engage in problem solving before asking me. | I create opportunities for students to imagine things that do not exist yet. | I design learning experiences that require students to create new digital products and not just consume ones that already exist. | I model how to modify media that other people have shared. |
|---|---|---|---|---|
| N | 454 | 454 | 454 | 452 |
| Missing | 1 | 1 | 1 | 3 |
| Mean | 2.98 | 2.39 | 2.21 | 2.13 |
| Median | 3 | 2 | 2 | 2 |
| Standard deviation | 0.79 | 0.894 | 0.957 | 0.97 |

# Elaboration (Behavioral)

| Behavioral Survey Items | When students show interest in something, I encourage them to explore it in detail. | I give students the freedom to be expressive in their class assignments. | When creating digital presentations, I reward students who pay attention to colors, fonts, images, audio/video. | When creating digital products, I reward students who carefully select media that demonstrate their understanding. |
|---|---|---|---|---|
| N | 454 | 455 | 454 | 452 |
| Missing | 1 | 0 | 1 | 3 |
| Mean | 3.19 | 2.98 | 2.64 | 2.88 |
| Median | 3 | 3 | 3 | 3 |
| Standard deviation | 0.704 | 0.805 | 0.922 | 0.852 |

# Flexibility (Behavioral)

| Behavioral Survey Items | I reward students for combining ideas in ways that other people have not tried. | I provide learning activities that allow students to create new things instead of doing repetitive exercises. | I reward students for creating new things instead of doing repetitive exercises. | I model how to find the materials needed to develop an idea. | I model how to find a solution with other available resources if a certain resource is not available. |
|---|---|---|---|---|---|
| N | 452 | 452 | 452 | 452 | 451 |
| Missing | 3 | 3 | 3 | 3 | 4 |
| Mean | 3.1 | 2.92 | 2.88 | 2.94 | 3 |
| Median | 3 | 3 | 3 | 3 | 3 |
| Standard deviation | 0.759 | 0.807 | 0.815 | 0.842 | 0.794 |

# Fluency (Behavioral)

| Behavioral Survey Items | I create learning activities that require students to explain interconnected concepts to peers. | I ask students to demonstrate novel ideas. | Students in my classroom demonstrate novel ideas through various digital products. | Students' classwork involves generating many novel solutions to a problem. |
|---|---|---|---|---|
| N | 448 | 448 | 449 | 448 |
| Missing | 7 | 7 | 6 | 7 |
| Mean | 2.72 | 2.69 | 2.37 | 2.42 |
| Median | 3 | 3 | 2 | 2 |
| Standard deviation | 0.806 | 0.78 | 0.862 | 0.826 |

# Endnotes

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