# Part1: A Reimagined Teacher Feedback and Support System
## Real and Lasting School Reform

*By Michael Selkis*
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**George Harrison** *once sang: "If you don't know where you are going, any road will take you there." That's how I feel about the current state of education reform—a collection of local solutions leading to nowhere.*

Real and lasting K-12 education reform starts with the teacher evaluation system. It is the single most impactful mechanism for foundational change because it is the nexus point for all aspects of the educational ecosystem. The status quo of teacher evaluation reforms in the U.S. is mired in complexity and inertia. According to an analysis by the National Bureau of Economic Research as well as several other studies, the effectiveness of teacher evaluation reforms has been underwhelming and has not led to substantial improvements in student outcomes.

The current state of teacher evaluation reforms is limited by several factors. First, reforms often face resistance from various stakeholders, including teachers' unions and political entities. Secondly, the fragmented nature of the U.S. education system leads to uneven application and impact of evaluation reforms. Additionally, many districts lack the necessary resources and expertise to implement and sustain comprehensive evaluation systems. Lastly, success in specific districts does not always translate to broader applicability, as local context can play a significant role.

Technological advancements have facilitated more sophisticated methods of teacher evaluation, including data analytics for student growth measures and digital platforms for peer feedback and observation. However, the application of these technologies varies widely across districts, often constrained by budget limitations and varying levels of technological infrastructure.

Equity remains a critical concern, especially for at-risk learners in underserved communities. The inconsistent implementation of evaluation reforms exacerbates existing disparities. Some districts have managed to use evaluation systems to improve equity by identifying and supporting underperforming teachers in high-need schools. However, without broader systemic support and adequate resources, these successes are difficult to scale or maintain.

While teacher evaluation reforms have not uniformly succeeded in enhancing student outcomes, there are pockets of success that offer valuable lessons. The challenge lies in scaling these successful models while addressing the broader systemic issues that impede widespread improvement.

# Part 2: A Quantitative Approach with a Humanistic Touch

A reimagined teacher evaluation system stands out as the singular reform mechanism capable of integrating and improving all aspects of the education ecosystem. The convergence of our understanding of instructional neuroscience with the urgency of addressing post-COVID educational landscape makes the present moment ripe for this transformative action. In

response, many districts are transitioning to a Multi-Tiered System of Supports, necessitating a comprehensive evaluation of their educational ecosystems.  It is within this space that we will bring groundbreaking, equitable and lasting change.

My primary goal has been to develop an intuitive educational software system that assists in quantitatively measuring teacher efficacy based on the neuroscience of learning and then use this new system as the mechanism to address all other aspects of education reform.

Within five years, school districts implementing the new evaluation system would see demonstrable improvements in teacher effectiveness and student performance. This system would also address COVID-related learning losses and establish a foundational mechanism for implementing MTSS. Over the next twenty years, widespread adoption of the evaluation system across districts and states will significantly reduce achievement gaps and it will transform the very DNA of school districts.

Several hypotheses have been explored to achieve this breakthrough. First, we investigated how neuroscience principles can be effectively integrated into teacher evaluation systems. Second, we examined the most effective multiple measures for evaluating teacher effectiveness through longitudinal studies comparing traditional methods with those incorporating quantitative neuroscience measures. Lastly, we have leveraged this new system of teacher evaluation to align a district's entire system to support teacher development.

My 360-degree understanding of the national educational ecosystem provides clear and layered insight into the limits of achievement within the current structures and philosophies present in education. We are at a critical inflection point to leverage our deep understanding of instructional neuroscience and adult development to address the pressing educational and mental health challenges of our post-COVID reality. The time is now.

## *Part 3: Educational Software Development: A Journey of Innovation and Adaptation*

*My goal was to develop intuitive, brain-based software that could measure teacher practices through time analysis and question vitality tracking. The initial focus was on time analysis, inspired by the National Center on Time and Learning, which views targeted time as a critical resource. Early trials, conducted in collaboration with a software developer, showed promise. Time analysis facilitated meaningful teacher discussions. However, broader implementation revealed deficiencies: time analysis alone was insufficient to significantly impact teaching practices.*

### *I Recognized the Need to Pivot*

**Data analysis** indicated a need for a more nuanced understanding of classroom efficacy. This led to the addition of a question-tracking feature, aiming to provide deeper insights into classroom dynamics. At this stage, I was developing the concept of question vitality, examining the impact of questions on cognitive engagement, divergent and convergent thinking, and other touchpoints. Integrating question vitality with time analysis provided more triangulation points, leading to more meaningful teacher conversations. I implemented the updated program in Georgia as part of my work on implicit bias and teacher development.

I employed a continuous cycle of reflection, analysis and inquiry by continuing to collect and analyze feedback. Systematic feedback collection and analysis identified core issues. While the software's analytical capabilities were valued, additional functionalities were needed, such as wait time tracking, turn-and-talk features, nuanced student categories, student touchpoints, and the impact of Depth of Knowledge (DOK) on question vitality. To enhance the software, I brainstormed new approaches, considering intuitive design elements and additional training resources. I established success criteria focusing on ease of use, user engagement, and data accuracy. Additionally, I met with AI companies to explore potential partnerships. ***AI is a wonderful tool but it cannot supplant the human-to-human interaction needed to properly support teachers. You have to be partners in the classroom.***

**Comprehensive training modules** were developed to support the software and processes. An organic testing approach was adopted, rolling out updates in phases and refining the software based on continuous feedback and experience. I am currently on the fifth iteration of the software.

## *Outcome and Lessons Learned*

Key lessons from this experience include the importance of flexibility in development, the necessity of a user-centric design approach, and the production of actionable data. The journey reinforced the value of a growth mindset and inquiry models for development. It emphasized the significance of flexibility and stakeholder engagement in driving successful and lasting positive change.

# *Part 4: Time and Question Data Analysis*

I have displayed the teacher observation data images for your reference. To proceed with the analysis, I will extract key insights from the data related to the time allocation and questioning patterns across the classrooms observed.

1. **Time Allocation:**
   - Student Work Time vs. Teacher-Led Time: In each class, how much time is dedicated to student-led activities versus teacher-directed time?
   - Transitions and Assessment of Learning: Identify the time spent in transitions and assessment, which can provide insights into the pacing and the structure of the lessons.

2. **Questioning Patterns:**
   - Number of Questions: How many questions are posed during each observation period, and what are the types of questions (Depth of Knowledge - DOK levels)?
   - Touchpoints and Student Participation: How often teachers engage with students during questioning, and the balance of student participation between male and female students.

**Insights Based on Time Allocation Analysis:**

1. *Class Butler:*
   - 71% of the class time was allocated to student work, while 29% was teacher-led. There were no transitions or additional activities like video-based learning. This suggests that the class was highly focused on student-led activities, offering ample time for independent or group work.

2. *Class Bates:*
   - A large proportion of the time (58%) was teacher-led, while only 27% was student work. This suggests a more teacher-centered approach during the observation. Additionally, 10% of the time was allocated to video or other non-instructional activities. This balance shows less student autonomy compared to Butler.

3. *Class Allen:*
   - This class shows a more balanced distribution between teacher-led (29%) and student work time (45%). It is noteworthy that assessment of student learning was higher here (22%), indicating more time was spent checking for student understanding or grading during the lesson.
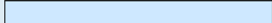
# Class Information:

| Class Name: | 5th |
|---|---|
| Teacher: | Allen |
| Alloted Time (min): | 30 |
| Observer: | Selkis |
| Start Time: | 12:00 |

## Aggregate Results:

| Teacher-Led Time | 00:07:16 | 29% |
|---|---|---|
| Video/Other | 00:00:55 | 4% |
| Assessment of Student Learning | 00:05:30 | 22% |
| Student Work Time | 00:11:21 | 45% |

### Graph Key

| Assessment of Student Learning | |
|---|---|
| Student Work Time | |
| Teacher-Led Time | |
| Transitions | |
| Differentiated Practice | |
| Video/Other | |



### Detailed Results

| Teacher-Led Time | Whole-Class Discussion / activity | 00:07:16 | Reading to class...great enthusiasm..turn and talk with text evidence |
|---|---|---|---|
| Video/Other | Video/Other | 00:00:55 | |
| Assessment of Student Learning | Oral Assessment of Student Learning | 00:05:30 | Reading |
| Student Work Time | Small Group Discussion/Activity | 00:04:43 | Discussing text questions together...do you need to differentiate? Or can all your kids access this material... |
| Student Work Time | Small Group Discussion/Activity | 00:06:38 | Very active teacher.....really liked how you taught that boy... |

## Class Information:

| | |
|---|---|
| Class Name: | 5th |
| Teacher: | Allen |
| Alloted Time (min): | 30 |
| Observer: | Selkis |
| Start Time: | 12:00 |

## Aggregate Results:

| | |
|---|---|
| Total Number of Questions | 9 |
| Average Number of Touchpoints per Question | 6.78 |
| Average Question Duration | 00:01:08 |
| Total Time Spent Talking by Teacher(s) | 00:03:31 |
| Total Time Spent Talking by Male Students | 00:02:23.189999999999998 |
| Total Time Spent Talking by Female Students | 00:00:20.91 |
| Total Time Spent Talking by Non-Binary Students | 00:00:00 |
| Time Spent Talking by Students during Questions | 00:02:44.0999999999999994 |
| Time Spent Talking by Students during Turn and Talk Periods | 00:03:44.78999999999999 |
| Time Spent Talking by Students | 00:06:28.889999999999986 |

## Wait Periods

| | |
|---|---|
| Total Number of 'Waits' during Questions | 4 |
| Total Time Spent in Wait Periods (sec) | 20.8 |

## Turn And Talks

| | |
|---|---|
| Total Number of 'Turn And Talks' during Questions | 8 |
| Total Time Spent in Turn And Talk Periods (sec) | 224.79 |

## Location Data

| | |
|---|---|
| Front Left | 67.21% |
| Front Right | 13.11% |
| Back Left | 18.03% |
| Back Right | 1.63% |

## Touchpoints by Entity

| | |
|---|---|
| Teachers | 60.65% |
| Non-Binary Gender | 0% |
| Female Gender | 9.83% |
| Male Gender | 29.5% |

## Total DOK Touchpoints
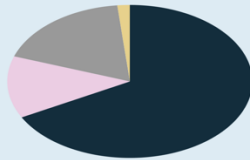
| | |
|---|---|
| Level One | 0 |
| Level Two | 0 |
| Level Three | 0 |
| Level Four | 0 |

### Location in Class



Front Left
Front Right
Back Left
Back Right

### Touchpoints By Person Type



Teachers
Female Students
Non-Binary Students
Male Students
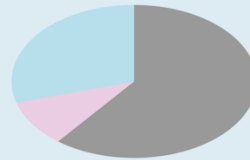
## Detailed Results:

| Question # | DOK Levels | # of Touchpoints | Wait Period (sec) | Turn And Talk (sec) | Question Duration (sec) |
|---|---|---|---|---|---|
| 1 | | 15 | 0 | 52.58 | 140 |
| 2 | | 15 | 5.33 | 21.16 | 109 |
| 3 | | 8 | 0 | 29.04 | 86 |
| 4 | | 5 | 0 | 0 | 25 |
| 5 | | 4 | 6.43 | 13.72 | 28 |
| 6 | | 3 | 4.35 | 0 | 16 |
| 7 | | 5 | 4.69 | 30.38 | 74 |
| 8 | | 2 | 0 | 11.06 | 30 |
| 9 | | 4 | 0 | 66.85 | 104 |
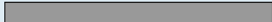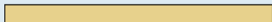
# Class Information:

| Class Name: | K |
|---|---|
| Teacher: | bates |
| Alloted Time (min): | 30 |
| Observer: | Selkis |
| Start Time: | 11:25 |

## Aggregate Results:

| Video/Other | 00:02:22 | 10% |
|---|---|---|
| Assessment of Student Learning | 00:06:36 | 27% |
| Teacher-Led Time | 00:14:03 | 58% |
| Transitions | 00:01:05 | 4% |

### Graph Key

| Assessment of Student Learning | |
|---|---|
| Student Work Time | |
| Teacher-Led Time | |
| Transitions | |
| Differentiated Practice | |
| Video/Other | |



### Detailed Results

| Video/Other | Video/Other | 00:00:00 | Brain break |
|---|---|---|---|
| Assessment of Student Learning | Oral Assessment of Student Learning | 00:00:01 | |
| Teacher-Led Time | Welcome / Lesson Launch | 00:00:11 | |
| Teacher-Led Time | Welcome / Lesson Launch | 00:06:09 | What is our pattern this month... looking at patterns |
| Assessment of Student Learning | Oral Assessment of Student Learning | 00:06:35 | Teacher led time but assessment...days of the week ...Is this an after lunch activity? |
| Video/Other | Video/Other | 00:02:22 | Brain break |
| Transitions | Transition to Next Component | 00:01:05 | |
| Teacher-Led Time | Teacher-Directed Instruction | 00:07:43 | |

## Class Information:

| | |
|---|---|
| Class Name: | 5th |
| Teacher: | Butler |
| Alloted Time (min): | 30 |
| Observer: | Selkis |
| Start Time: | 8:35 |

## Aggregate Results:

| | |
|---|---|
| Total Number of Questions | 13 |
| Average Number of Touchpoints per Question | 3.85 |
| Average Question Duration | 00:00:30.15 |
| Total Time Spent Talking by Teacher(s) | 00:02:10.990000000000009 |
| Total Time Spent Talking by Male Students | 00:01:14.310000000000002 |
| Total Time Spent Talking by Female Students | 00:00:47.49 |
| Total Time Spent Talking by Non-Binary Students | 00:00:00 |
| Time Spent Talking by Students during Questions | 00:02:01.79999999999999972 |
| Time Spent Talking by Students during Turn and Talk Periods | 00:03:49.139999999999999986 |
| Time Spent Talking by Students | 00:05:50.94 |

## Wait Periods

| | |
|---|---|
| Total Number of 'Waits' during Questions | 0 |
| Total Time Spent in Wait Periods (sec) | 0 |

## Turn And Talks

| | |
|---|---|
| Total Number of 'Turn And Talks' during Questions | 2 |
| Total Time Spent in Turn And Talk Periods (sec) | 229.14 |

## Location Data

| | |
|---|---|
| Front Left | 60% |
| Front Right | 10% |
| Back Left | 10% |
| Back Right | 20% |

## Touchpoints by Entity

| | |
|---|---|
| Teachers | 60% |
| Non-Binary Gender | 0% |
| Female Gender | 18% |
| Male Gender | 22% |

## Total DOK Touchpoints
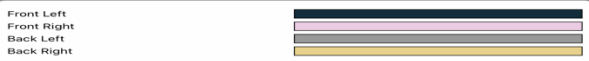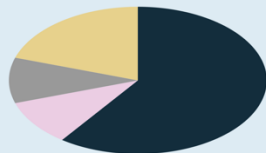
| | |
|---|---|
| Level One | 0 |
| Level Two | 0 |
| Level Three | 0 |
| Level Four | 0 |

### Location in Class



| | |
|---|---|
| Front Left | ▬▬▬ |
| Front Right | ▬▬▬ |
| Back Left | ▬▬▬ |
| Back Right | ▬▬▬ |

### Touchpoints By Person Type



| | |
|---|---|
| Teachers | ▬▬▬ |
| Female Students | ▬▬▬ |
| Non-Binary Students | ▬▬▬ |
| Male Students | ▬▬▬ |
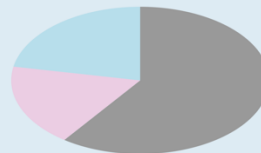
## Detailed Results:

| Question # | DOK Levels | # of Touchpoints | Wait Period (sec) | Turn And Talk (sec) | Question Duration (sec) |
|---|---|---|---|---|---|
| 1 | | 1 | 0 | 91.84 | 2 |
| 2 | | 6 | 0 | 0 | 35 |
| 3 | | 3 | 0 | 0 | 10 |
| 4 | | 5 | 0 | 0 | 11 |
| 5 | | 9 | 0 | 0 | 48 |
| 6 | | 8 | 0 | 0 | 43 |
| 7 | | 3 | 0 | 0 | 9 |
| 8 | | 6 | 0 | 0 | 61 |
| 9 | | 2 | 0 | 137.3 | 141 |
| 10 | | 1 | 0 | 0 | 2 |
| 11 | | 1 | 0 | 0 | 3 |
| 12 | | 1 | 0 | 0 | 7 |
| 13 | | 4 | 0 | 0 | 20 |

# Class Information:

| Class Name: | 5th |
|---|---|
| Teacher: | Butler |
| Alloted Time (min): | 30 |
| Observer: | Selkis |
| Start Time: | 8:35 |

## Aggregate Results:

| Student Work Time | 00:18:52 | 71% |
|---|---|---|
| Teacher-Led Time | 00:07:40 | 29% |

### Graph Key

| Assessment of Student Learning | |
|---|---|
| Student Work Time | |
| Teacher-Led Time | |
| Transitions | |
| Differentiated Practice | |
| Video/Other | |
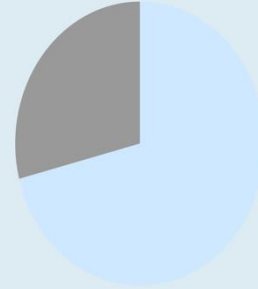
### Detailed Results

| Student Work Time | Independent Practice/Activity | 00:00:08 | |
|---|---|---|---|
| Student Work Time | Independent Practice/Activity | 00:09:11 | Let's try these: converting measurements ...Teacher is circulating and assisting...Have you considered having students asking students first? |
| Student Work Time | Small Group Discussion/Activity | 00:04:11 | Young boy in back corner? Seemed out of it |
| Teacher-Led Time | Whole-Class Discussion / activity | 00:04:35 | Word problem |
| Teacher-Led Time | Whole-Class Discussion / activity | 00:00:11 | |
| Teacher-Led Time | Whole-Class Discussion / activity | 00:01:22 | |
| Student Work Time | Independent Practice/Activity | 00:00:33 | Why not let them try it without any set up from you? What do you think would happen? |
| Student Work Time | Independent Practice/Activity | 00:02:44 | Teacher is circulating |
| Student Work Time | Small Group Discussion/Activity | 00:02:05 | Discuss and justify |
| Teacher-Led Time | Whole-Class Discussion / activity | 00:01:32 | Somebody clarify fro me...you did that a lot: good |

## Class Information:

| Class Name: | K |
|---|---|
| Teacher: | bates |
| Alloted Time (min): | 30 |
| Observer: | Selkis |
| Start Time: | 11:25 |

## Aggregate Results:

| Total Number of Questions | 10 |
|---|---|
| Average Number of Touchpoints per Question | 2 |
| Average Question Duration | 00:00:04.6 |
| Total Time Spent Talking by Teacher(s) | 00:00:36.95 |
| Total Time Spent Talking by Male Students | 00:00:07.49 |
| Total Time Spent Talking by Female Students | 00:00:01.04 |
| Total Time Spent Talking by Non-Binary Students | 00:00:00 |
| Time Spent Talking by Students during Questions | 00:00:08.53 |
| Time Spent Talking by Students during Turn and Talk Periods | 00:00:00 |
| Time Spent Talking by Students | 00:00:08.53 |

## Wait Periods

| Total Number of 'Waits' during Questions | 0 |
|---|---|
| Total Time Spent in Wait Periods (sec) | 0 |

## Turn And Talks

| Total Number of 'Turn And Talks' during Questions | 0 |
|---|---|
| Total Time Spent in Turn And Talk Periods (sec) | 0 |

## Location Data

| Front Left | 80% |
|---|---|
| Front Right | 0% |
| Back Left | 10% |
| Back Right | 10% |

## Touchpoints by Entity

| Teachers | 75% |
|---|---|
| Non-Binary Gender | 0% |
| Female Gender | 10% |
| Male Gender | 15% |

## Total DOK Touchpoints
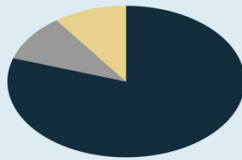
| Level One | 0 |
|---|---|
| Level Two | 0 |
| Level Three | 0 |
| Level Four | 0 |

Location in Class



| Front Left |
| Front Right |
| Back Left |
| Back Right |

Touchpoints By Person Type



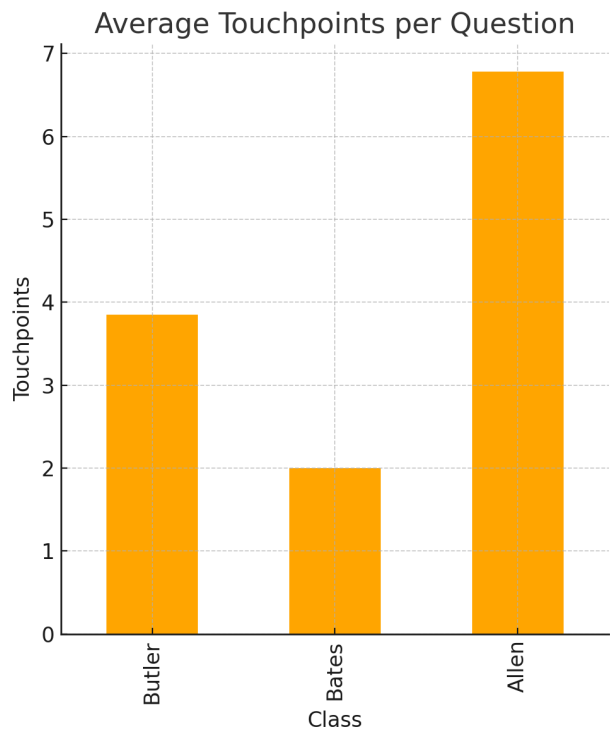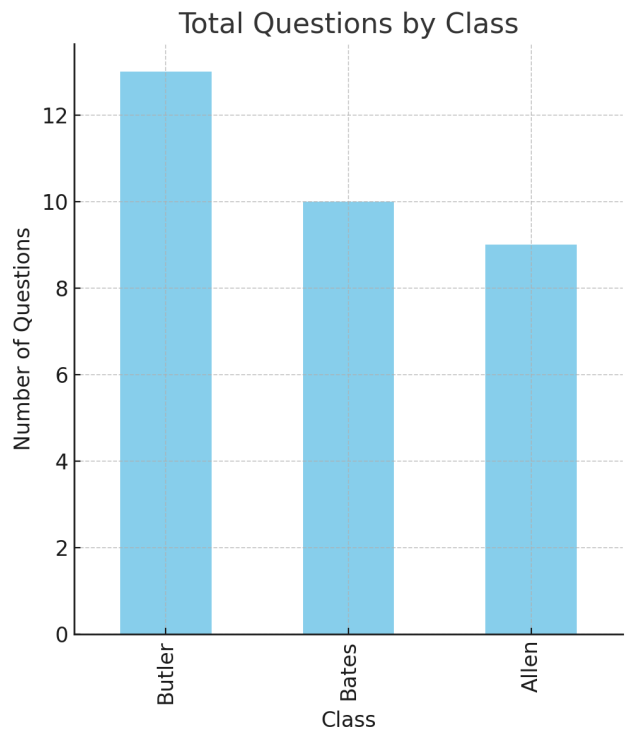| Teachers |
| Female Students |
| Non-Binary Students |
| Male Students |
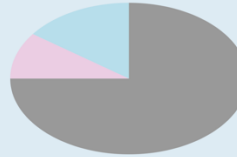
## Detailed Results:

| Question # | DOK Levels | # of Touchpoints | Wait Period (sec) | Turn And Talk (sec) | Question Duration (sec) |
|---|---|---|---|---|---|
| 1 | | 3 | 0 | 0 | 4 |
| 2 | | 3 | 0 | 0 | 11 |
| 3 | | 1 | 0 | 0 | 2 |
| 4 | | 1 | 0 | 0 | 1 |
| 5 | | 1 | 0 | 0 | 3 |
| 6 | | 1 | 0 | 0 | 1 |
| 7 | | 3 | 0 | 0 | 11 |
| 8 | | 1 | 0 | 0 | 2 |
| 9 | | 3 | 0 | 0 | 5 |
| 10 | | 3 | 0 | 0 | 6 |

## Time Allocation by Activity in Class Observations



## Total Questions by Class



## Average Touchpoints per Question
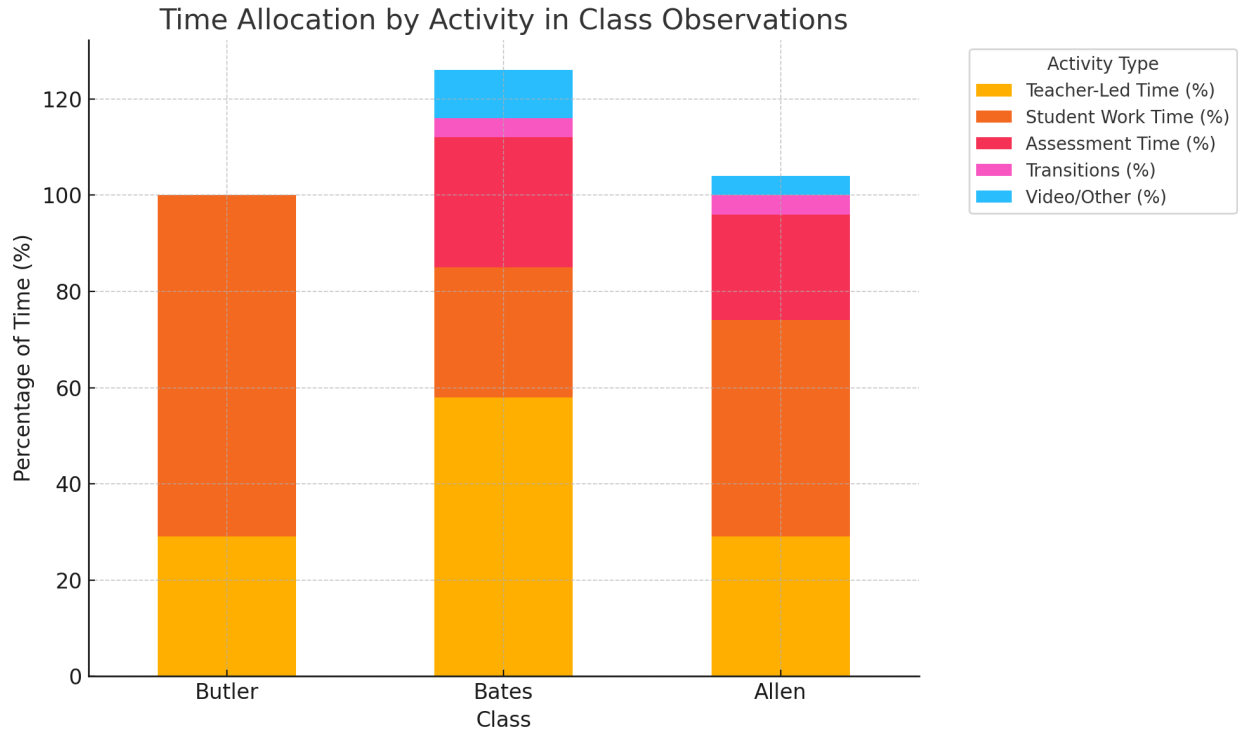


**Next Steps:** To gain a deeper understanding of student participation and questioning patterns in these classrooms, I will now analyze the questioning data.

***Insights Based on Questioning Patterns:***

1**. Total Number of Questions:**
   - Butler class posed the most questions with a total of 13, followed by Bates with 10, and Allen with 9. This suggests that in terms of quantity, Butler had the most teacher-student interactions focused on questioning.

2. **Average Touchpoints per Question:**
   - The Allen class had significantly more touchpoints per question (6.78) compared to *Butler* (3.85) and Bates (2). This indicates that in the Allen class, each question led to more extended interactions, possibly involving more students or deeper engagement.

3. **Average Question Duration:**
   - Butler had the longest average question duration (30.15 seconds), which may suggest either more complex questions or longer responses from students. The Allen class had a shorter average question duration (18 seconds), but with more frequent touchpoints, indicating active student participation.

4. **Teacher vs. Student Talk Time:**
   - In Butler and Allen classes, students spoke for more time than teachers during questioning periods, indicating a high level of student engagement. Bates showed a significantly lower student talk time, which aligns with the more teacher-directed structure observed earlier.

**Conclusion:**
- The ***Butler class*** showed a high frequency of questioning with moderate student engagement.
- The ***Bates class*** was more teacher-directed, with fewer touchpoints per question and less student talk time.
- The ***Allen class*** balanced teacher-led and student work time effectively, with more frequent and deeper student participation during questioning.

These patterns offer insights into the different instructional strategies and how they impacted student engagement and participation across the observed classes.

## *Part 5: What Has Informed My Path*

***What has informed my path*** to lead me to this moment can be traced back to a carefully curated selection of seminal sources that have profoundly shaped my understanding of education, social justice, and personal development. Each of these sources has served as a lever, incrementally guiding me to the understanding that a reimagined quantitively based teacher evaluation system is the key mechanism for education reform.  I have been engaged in a tight coupling of theory-informed practice and practice-informed theory, tested and refined through experience.

**Zaretta Hammond's, "Culturally Responsive Teaching and the Brain"** is foundational in my approach to education. Hammond's insights into how educators can leverage students' cultural knowledge as a scaffold for new learning underscore the importance of social-emotional connections in creating safe learning environments. Her work, deeply grounded in brain

research, offers practical strategies that have been indispensable in my practice, particularly in recognizing and responding constructively to diverse cultural displays of learning.

**The Right Question Institute** has been pivotal in enhancing my ability to empower students and colleagues through questions. The power of inquiry they advocate aligns perfectly with my belief in fostering confidence and power through engagement, which has transformed both my teaching methodology and my leadership approach.

**Elle Drago-Severson's adult development theory**, with her model of four pillar practices, has been instrumental in understanding and supporting adult learning. Her focus on teaming, leadership roles, collegial inquiry, and mentoring has informed how I facilitate professional development, ensuring it is meaningful and responsive to the diverse ways adults process experiences.

**Richard Elmore's work** on models of learning and instructional rounds has provided a structured approach to observing and improving teaching practices. His frameworks have been integral in my efforts to create systematic, collaborative environments for educators to reflect on and enhance their instructional strategies.

**Henry Louis Gates Jr.** has deeply influenced my perspective on social justice. His pioneering work on African and African American literature, along with the historical insights in Lerone Bennett Jr.'s *Before the Mayflower*, has enriched my understanding of the black experience in America. This knowledge has reinforced my commitment to equity and informed my efforts to create inclusive educational spaces.

**Robert Marzano's models** for teacher evaluations and his focus on student-centered classrooms remind me of the importance of engaging students on multiple levels. His questions for internal student audits—covering feelings, interest, importance, and self-efficacy—are tools I regularly use to ensure my teaching resonates with and supports my students.

**Carol Dweck's theory of growth versus** fixed mindsets has been crucial in fostering a culture of resilience and perseverance. By promoting the belief that abilities can develop with practice, Dweck's insights help me encourage both students and colleagues to embrace challenges as opportunities for growth.

**Dr. Bryant T. Marks, Sr.'s** teachings on implicit bias have been essential in refining my instructional and leadership decisions. His work with the National Institute on Race and Equity has heightened my awareness of how unconscious biases can affect educational outcomes, guiding me to more equitable practices.

**The American Institutes for Research's (AIR) MTSS** Center provides a comprehensive roadmap for addressing the needs of neurodivergent populations. Their emphasis on teacher development as the cornerstone of systemic change has reinforced my belief in continuous professional growth as the pathway to effective and inclusive education.

Lastly, the values imparted by my parents—kindness, humility, and equity—are the pillars upon which my personal and professional life is built. Their teachings have instilled in me a deep commitment to justice and compassion, principles that underpin all my decisions and interactions.

Together, these sources have not only informed my path but have also coalesced into a cohesive framework that guides my practice and ongoing professional development. Each source, reflecting theory and practice, has been a critical component in the continuous interplay of learning, reflection, and application in my journey.