A.T.A.C. 19
A Trilateral Approach to COVID-19

--- The Challenge 2020 ---
Meet Our Team : The Brainy Bunch

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The Problem at Hand

From worrying about our normal day to day routines to a world filled with COVID-19...

Easy Transmission  Remains on Surfaces  =  New Normal
Our New Normal

Affects the following:

Really, the list may seem endless
Our Thought Process

Our First Pick: The Cafeteria

Issues:
1) Most likely will not be used for eating
   a) Too many risks associated with eating/taking off masks
   b) Schools with 4000+ students, like Hamilton, might find it difficult to house all students for lunch while keeping them safe
2) A solution might be to keep lunch lines outside the schools going (like they are now) and send other students home for lunch

End conclusion we reached:
Focus on the generic classroom because of its wide applicability
Zooming in on Our Location: The Classroom

Base Information:

Average classroom size: 900 square feet

Class sizes must be smaller

Our Focus:

The communal aspect of classrooms
a) Shared services
b) Communication between teachers and students

Our Goals:
What do people in our community think?

How would you prefer school to start this fall?

40 responses

- 50% All in person
- 37.5% A mix of both
- 12.5% All online
What do people in our community think?

Are you willing to wear a form of mask in the classroom and around school?

39 responses

- Yes: 94.9%
- No: (small portion)
What do you miss the most about being in the classroom?
Interacting with my students, them interacting and collaborating together

What do you believe to be the most difficult challenge about online learning?
Missing the relationships and it is all the same lesson, where as we can differentiate in the classroom and meet students where they are

What is the most important aspect of education that you believe was lost in purely online schooling?
Human interaction and learning from each other

How do you think schools could improve online education so that it would be equally interactive for students physically in a classroom and for students learning online?
Flipped model where teaching is happening in class and readings, practice and "busy" work would be done at home.
A Student’s View on School

What do you miss the most about being in the classroom?
Social connection of learning in groups with other classmates

What do you believe to be the most difficult challenge about online learning?
Staying Motivated

How do you think schools could improve online education so that it would be equally interactive for students physically in a classroom and for students learning online?
More online group communicating

Are you willing to learn/teach in areas other than a traditional classroom like the gym, cafeteria, or outside to better accommodate social distancing?
Yes

How would you prefer school to start this fall?
A mix of online and in person classes
A.T.A.C Part A: (Planning Solutions)

1. Online sign up genius that limits number of kids to 10-12 per class
2. Virtual learning continues
3. In-person and online tutoring available, online sign up
A Schedule Layout

<table>
<thead>
<tr>
<th>Class Schedule for Freshmen:</th>
<th>Class Schedule for Junior:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrival: 6:50-7:05</td>
<td>Arrival: 7:30-7:45</td>
</tr>
<tr>
<td>First Hour: 7:10-8:10</td>
<td>First Hour: 7:50-8:50</td>
</tr>
<tr>
<td>Second hour: 8:20-9:20</td>
<td>Second hour: 9:00-10:00</td>
</tr>
<tr>
<td>Third Hour: 9:30-10:30</td>
<td>Third Hour: 10:10-11:10</td>
</tr>
<tr>
<td>Lunch Release: 10:30-11:45</td>
<td>Lunch Release: 11:10-12:25</td>
</tr>
<tr>
<td>Fourth Hour: 11:50-12:50</td>
<td>Fourth Hour: 12:30-1:30</td>
</tr>
<tr>
<td>Fifth Hour: 1:00-2:00</td>
<td>Fifth Hour: 1:40-2:40</td>
</tr>
<tr>
<td>Sixth Hour: 2:10-3:10</td>
<td>Sixth Hour: 2:50-3:50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class Schedule for Sophomore:</th>
<th>Class Schedule for Senior:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrival: 7:10-7:25</td>
<td>Arrival: 7:50-8:05</td>
</tr>
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<td>Fifth Hour: 2:00-3:00</td>
</tr>
<tr>
<td>Sixth Hour: 2:30-3:30</td>
<td>Sixth Hour: 3:10-4:10</td>
</tr>
</tbody>
</table>
A.T.A.C Part B: (Behavioral Solutions)

1. Social Distancing (6+ ft apart)
   a. Directed one way hallway pathways
   b. Students and teachers wearing face masks at all times while at school
   c. Desks in classrooms are 6 feet apart
   d. No Cafeteria tables => people sit on the floor in outlined circles (used for classes that are too large for the regular classroom space)

2. Plexiglass dividers between desks, portable plexiglass dividers for students

3. Online textbooks

4. Staggered passing periods and lunches

5. Installation of foot handles on doors and door holders to ensure doors stay open during passing periods
A Visual Depiction of A.T.A.C. Part B

Total square ft of classroom is 910 ft²

Area for teacher to write/draw on whiteboard or show demonstrations

Teacher desk with chair

Desk with chair

Automatic Hand sanitizer dispenser

Entrance/Exit

35 ft

26 ft

6 ft

2 ft

4 ft

6 ft

6 ft

3 ft

10 ft

Desk with chair

Desk with chair

Desk with chair

Desk with chair

Desk with chair

Desk with chair

Desk with chair

UV Washing Station/Cabinet to place the COVID-19 Preventing wristbands
Sketched Outlines of Details in A.T.A.C. Part B

In Classroom:

- Idea #1
  - Desk
  - Chair
  - Desk surface

- Another desk + chair
- Plexiglass dividers

(other cheaper material can be used for dividers... must be sanitized often; this is because students don't contact dividers directly)

- Idea #2
  - Desk
  - Chair
  - Desk surface

- Another desk + chair

In Hallways:

- Person 1
  - Folded plexiglass desk shields
  - Dividers stay put in class

- Person 2

*dividers are hinged, makes them foldable*
A.T.A.C Part C: (Technological Solutions)

Containment of COVID

1) Reusability: UV cleaning stations for bacteria on washcloths, wristbands, and masks=> UV lighting and UV sanitation stations
2) Use a wearable machine (like a wristband that looks like a fitbit or apple watch) that students keep on their person which measures their temperature regularly and beeps when students are standing closer than six feet apart (maybe through specialized gps or radio frequency?).
3) Automatic Hand sanitizer station located at the entrances and exits of classrooms.
4) Installing new air filtration systems and open ventilation by keeping windows and doors open.
A.T.A.C Part C: (Technological Solutions) - Illustrated

UV Technology

Used to sterilize:
1) Cleaning Rags
2) Masks
3) Wristbands

Sanitation Systems

Wristbands

Used to:
1) Measure temperature
2) Ensure students are maintaining social distancing regulations

Ensures students are healthy and helps students stay healthy
COVID is transferred through the air from student to student even if social distancing is maintained. All students receive air and do not infect other students around them if they are abiding by social distancing standards.
Barriers to Design Implementation

1. Parts A & B
   - Fast and easy to put into place
   - Inexpensive, most schools should be able to afford the necessary supplies
   - Some students may ignore tape markings/online sign up

2. Part C
   - Will require more time to be implemented
   - More expensive in upfront costs and to maintain
   - Will likely not be ready by the fall
# How A.T.A.C will Change the Space

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Continued interactions between students and teachers</td>
<td>● Students and Teachers feel out of place</td>
</tr>
<tr>
<td>● Accountability for work</td>
<td>● Different Environments</td>
</tr>
<tr>
<td>● Continue Education</td>
<td></td>
</tr>
</tbody>
</table>
What We Learned and How We Worked as a Team
Why Our Solution is Unique

1. Makes solution well-rounded
2. Makes solution widely applicable
3. Covers several aspects that comes with implementing any change successfully
   a) Planning
   b) Architectural/Physical
   c) Behavioral
   d) Technological

Well received based on:
Appendix A (Sources of Information)

“An Engineering Student Has Built a 'Kavach' for Social Distancing - Latest News: Gadgets Now.” *Gadgets Now*,


Andrew.cohen@sporttechie.com. “Bundesliga Teams Use Kinexon's SafeZone Wristband to Maintain Social Distancing Among Game Day Staff.” *SportTechie*, 27 May 2020,


Farge, Emma. “Swiss Back-to-School Angst Illustrates Worries around Easing Lockdowns.” Reuters, Thomson Reuters, 10 May 2020,

Feisel, Lyle D, and Albert J Rosa. The Role of the Laboratory in Undergraduate Engineering ... pdfs.semanticscholar.org/d27f/1c6224f0e1b3e9cbfd459f2b87166484d603.pdf.


Katkar, Jagruti. “Young Engineer Develops "KAWACH" to Ensure Social Distancing.” The Machine Maker, 2 Apr. 2020,

Appendix A (Source of Information)


Appendix B (Pictures)


Appendix B (Pictures)


“Transparent Cartoon #1575623 (License: Personal Use).” Cartoon Student - Student Png Download - 1000*1000 - Free Transparent Cartoon Png Download. - Clip Art Library, clipart-library.com/clip-art/transparent-cartoon-1.htm.