The Problem

In modern day society, we all use technology. We have all come to acclimate to it that we fall to notice the ways it affects our health. To include the very laptops we use for our everyday schoolwork. Although a useful tool, laptops used in schools can take a negative effect on our bodies such as causing headaches, fatigue, eye strain, poor posture, and lack of sleep.

Why Is It a Problem?

These effects can take a toll on a person and can negatively impact their performance greatly. One of these ways, laptops screens in general, affect the natural production of melatonin in the body. Melatonin is a natural hormone produced by the pineal gland. This hormone is triggered by the light signal and then signals the brain to lower our body temperature, existing us to become tired. This is where artificial light, like the laptop, affects us. Laptops are found in everything from kids lessons to seminars to our day-to-day lives. A student staring at one for the amount of time required to do schoolwork won’t be able to sleep, thus negatively affecting their performance the next day. This isn’t the only way screens affect our brain, they are also damaging it.

All screen devices (i.e., phones, tablets, laptops) have a direct influence on our vision. The effects of this are being studied by Virginia L. Druckman states that devices that have been shown to cause vision problems include computer and gaming among others. The studies have shown that screen time is linked to increased levels of blue light. Blue light suppresses melatonin production, which can disrupt sleep patterns.

A reflection on the problem solving process:

1. The problem solving process:

   a. Problematic: There are many problems to solve. The main issue is the amount of time spent on laptops in the classroom. The solution to this problem is to limit the amount of time spent on laptops in the classroom.

   b. Reflection: This can be solved by setting specific times for when laptops can be used, such as during class or for homework.

2. An explanation of how the data analysis led to the proposed solution:

   a. Data analysis:

      i. Data collection:

         a. Students were surveyed to determine how much time they spent on laptops each day.

      ii. Data analysis:

         a. The data was analyzed to determine the average amount of time students spent on laptops.

   b. Proposed solution:

      i. Setting specific times for when laptops can be used.

3. A discussion of the chosen solution and the other solutions that were considered:

   a. A problem-based retreat: This type of retreat focuses on solving problems through group discussion. This type of retreat would be beneficial for students who may not be as comfortable with technology.

   b. An app-based solution: This type of solution would be beneficial for students who are comfortable with technology and are looking for a more interactive way to learn about these issues.

   c. A peer-to-peer solution: This type of solution would be beneficial for students who are comfortable with technology and are looking for a more interactive way to learn about these issues.

   d. A solution that combines all of the above:

      i. The solution would be a combination of a peer-to-peer solution and an app-based solution. This would allow for a more interactive and engaging way to learn about these issues.

4. A discussion of the potential impact of the chosen solution:

   a. The chosen solution would have a positive impact on students' health by limiting the amount of time spent on laptops.

   b. The chosen solution would also have a positive impact on students' performance by improving their sleep habits.

   c. The chosen solution would also have a positive impact on the environment by reducing the amount of energy used by laptops.

   d. The chosen solution would also have a positive impact on the economy by reducing the need for energy-intensive devices.

5. A discussion of the potential challenges of implementing the chosen solution:

   a. The chosen solution may be challenging to implement due to the need for new technology and training for teachers and students.

   b. The chosen solution may also be challenging to implement due to the need for new policies and procedures.

   c. The chosen solution may also be challenging to implement due to the need for new equipment and infrastructure.

6. A discussion of the potential benefits of implementing the chosen solution:

   a. The chosen solution would have numerous benefits, including improved health, improved performance, and reduced environmental impact.

   b. The chosen solution would also have numerous economic benefits, including reduced energy costs and increased productivity.

   c. The chosen solution would also have numerous educational benefits, including improved student engagement and access to technology.

7. A discussion of the potential barriers to implementing the chosen solution:

   a. The chosen solution may be challenging to implement due to the need for new technology and training for teachers and students.

   b. The chosen solution may also be challenging to implement due to the need for new policies and procedures.

   c. The chosen solution may also be challenging to implement due to the need for new equipment and infrastructure.

8. A conclusion:

   a. The chosen solution would have numerous benefits, including improved health, improved performance, and reduced environmental impact.

   b. The chosen solution would also have numerous economic benefits, including reduced energy costs and increased productivity.

   c. The chosen solution would also have numerous educational benefits, including improved student engagement and access to technology.

   d. The chosen solution is a great solution for improving the health and well-being of students in the classroom.
Student #17: Part 1
In modern day society, we all use technology. We have all come so accustomed to it that we fail to notice the ways it affects our health; that includes the very laptops we use for our everyday schoolwork. Although a useful tool, laptops used in schools can take a negative effect on our bodies such as causing headaches, fatigue, eye strain, poor posture, and lack of sleep.
These effects can take a toll on a person and can negatively impact their performance greatly. One of these ways is how screens, in general, affect the natural production of melatonin in the body.

Melatonin is a natural hormone produced by the pineal gland. This hormone is triggered by the lack of light and then signals the brain to lower our body temperature, causing us to become tired. This is where artificial light ruins this cycle. Blue lights are found in everything from lamps to televisions to our school laptops. A student staying up late into the night cramming in homework won't be able to sleep, thus negatively affecting their performance the next day. This isn't the only way screens affect the brain, they are also damaging it.

An article titled "Gray Matters: Too Much Screen Time Damages The Brain" by Victoria L. Dunckley states that tests were done on those with internet/gaming addictions and the studies have shown shrinkage or loss of tissue volume in important parts of the brain such as the frontal lobe. "Multiple studies have shown atrophy (shrinkage or loss of tissue volume) in gray matter areas (where "processing" occurs) in internet/gaming addiction (Zhou 2011 (link is external), Yuan 2011 (link is external), Weng 2013 (link is external), and Weng 2012 (link is external)). Areas affected included the important frontal lobe, which governs executive functions, such as planning, prioritizing, organizing, and impulse control" (Dunckley M.D.).

How does all this affect the average student though? One article titled, "Study: Computer Use in School Doesn't Help Test Scores" was specifically helpful in finding the answer to this question. After looking at computer use among 15-year-olds (across 31 regions and nations) it was found that students who used computers more at school had lower reading and math scores than those who didn't. "Those that use the internet every day do the worst," said Andreas Schleicher, OECD Director for Education and Skill" (The Hechinger Report).
Student #17: Part 2
Have you experienced any of these effects while using a laptop during school (check all that apply)?

<table>
<thead>
<tr>
<th>Affects</th>
<th>Number of People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drowsiness</td>
<td>46</td>
</tr>
<tr>
<td>Headache</td>
<td>45</td>
</tr>
<tr>
<td>Asthenopia (eye strain)</td>
<td>44</td>
</tr>
<tr>
<td>None of the above</td>
<td>43</td>
</tr>
</tbody>
</table>

How many of your classes require a laptop to be used (overall)?

- Eight Classes: 15
- Seven Classes: 16
- Six Classes: 20
- Five Classes: 14
- Four Classes: 18
- Three Classes: 13
- Two Classes: 5
- One Class: 4
- Text: 13

These surveys were sent to students of High School. 106 answered.
Student 17: Part 3
To completely eliminate the use of laptops though is not the case. Laptops are a great tool to use for research on projects. By using online resources it saves the school money that would have been spent on textbooks. It is the amount of time spent on laptops that is the problem. A solution to this school wide problem would be to limit the amount of laptop use within a school day. A good way to begin this process would be to have teachers create their assignments on paper and having large presentations on paper such as a trifold, poster, diorama, etc. With more projects being done on paper it would reduce time being spent on computers and the number of students who are experiencing the effects such as drowsiness, headache, and asthenopia.
1. **The problem-solving process:**

   When researching this issue I directly asked myself the "how" and "why" when it came down to the effects laptops have on the human brain. Why did these effects happen and how exactly were these things happening? Just how much screen time could the brain handle before experiencing common effects. The same goes for how does it affect the student body in terms of grades and their ability to perform. By doing this I was able to gather all information I needed to back up my claim and further prove the negative health effects screens have on us.

   Some of the data collected included a survey sent out to the entire student body of [Redacted] High School. Information gathered from that included how students were affected by the laptops, how many of their classes required a laptop to be used, and if they felt laptops were a positive or negative impact on their learning.
2. **An explanation of how the data analysis led to the proposed solution:**

Although all the information helped, the greatest source of information was the surveys sent out to the students. It proved itself the most important because I felt it was more relatable because its data that came straight from the students. The trend in the data collected was also consecutive and not one-sided, which was surprising to me. Each effect felt from using laptops were all around the same number- even the “None of the above” option had the same amount of answers.

The second most important would be Victoria L. Dunckley's article "Gray Matters: Too Much Screen Time Damages the Brain" because it was the most eye-opening. I knew there were effects on the body from too much exposure to screens but I never imagined it actually damaged our brains in some ways. "In short, excessive screen-time appears to impair brain structure and function. Much of the damage occurs in the brain’s frontal lobe, which undergoes massive changes from puberty until the mid-twenties. Frontal lobe development, in turn, largely determines success in every area of life—from sense of well-being to academic or career success to relationship skills" (Dunckley). This kind of information helps explain the seriousness of the problem stated and is why we should have limited time on our school laptops.

The third source of information I found most important was the article, "Study: Computer Use in School Doesn't Help Test Scores" because of it's great source of information based on test scores. It describes how The Organization for Economic Cooperation and Development took down data by overseeing computer use among 15-year-olds across 31 nations and regions and found that students who used computers more at school had both lower reading and lower math scores. "The study, published Sept. 15, 2015, was actually conducted back in 2012, when the average student across the world, for example, was using the Internet once a week, doing software drills once a month, and emailing once a month. But the highest-performing students were using computers in the classroom less than that" (The Hechinger Report). This helps prove the importance of using paper rather than technology when it comes to teaching something.
3. **A discussion of the chosen solution and the others that were considered:**

With a problem as broad as this, many solutions were thought of, whether that be a large or small solution. The one solution that was going to be the second choice was to mention simple ways one can accustom to using a laptop a lot. This would include using proper lighting, using the "night shift" option in settings, minimize glare, or even considering computer eyewear. This would minimize the effects felt when using laptops and would also be easier but I felt it defeated the purpose of bringing awareness to the issue.

Another solution was to require each class a "break time" period. During this period students would relieve themselves of screens and focus on other work that may be on paper. Although this might reduce the effects of too much screen time I feel it wouldn't be used properly. Students would see this as an overall break and wouldn't be getting any work done. This solution would also be based on the assumption that teachers would have work on paper.

The final, and unrealistic solution would be to eliminate the use of laptops altogether. Again, this would remove every and all possibility of students experiencing the effects stated before but would also impact the school negatively. Easily accessible resources would be diminished and the school would have to invest a lot of money in providing each and individual student with textbooks updated to that year. This would take away money from many other activities and experiences in our school.

When looking at all these solutions (including the chosen solution above) side by side, it was an obvious choice in deciding which would work best. The chosen solution limits the use of laptop use and reduces effects of too much screen time, all the while keeping the laptops proper use for research purposes.

The intended audience for this project is students and teachers alike. By taking the time to look at this project I hope they can see the seriousness of this problem and how it affects a student's performance, as well as their daily lives. I hope that one day there will be a change in how we use these resources and that one day they won't be used for every school project like they are now.
Sources


