1) Non-desktop user interfaces:
   • Mobile phone
     a) The mobile phone is mainly used as a means of communication. Therefore it is designed so that you can hear as well as talk through it. Since people carry their phones where ever they go the mobile phone has gotten smaller and lighter throughout the years. The increased usage of mobile phones for work has made an impact on the phone. Now it is no longer just a means to communicate but a device where you can check your Internet, and there fore write an e-mail etc. Due to this the phone has been updated to have a keyboard- eg the Black Berry.
     b) Three strengths of the mobile phone:
        1. The size. Because it is so small and light it is easy to carry around where ever you go. You don't need a separate bag to carry it around in.
        2. The keypad is small so you don't need to use two hands to use it. Therefore you can do other tasks while talking on the phone.
        3. The red button (for hanging up) and the green button (for calling) is usually visible and intuitive to use.
     c) Three weaknesses:
        1. The buttons on the side of the phone aren't intuitive and the usage of these changes depending on the vendor (ex T-mobile, AT&T). One of them is labeled with an up and down arrow so that is fine. Maybe have a camera icon on the button controlling the camera etc. You should also make these the same for all vendors.
        2. Some of the slider phones don't have a lot of friction so it slides up and down too easily. That way it's easy to end a call by accident when it slides down. You should make sure there is additional friction-just enough that you have to exert a little effort to slide open and slide close the phone.
        3. On my cell phone if you want to change a sim card or open the back to check the battery it's usually difficult. There are no edges or grooves to indicate where to open it. They did this in order to make it look sleek. Instead there should be groves indicating where you either have to push or pull the back out.
   • Car GPS:
     a) GPS stands for global positioning system. This device enables you to navigate while you're in your car. You can also search for close by locations. It is used in work with taxi drivers. A lot of taxi drivers use the system to check the distance to the location and estimate how much the ride will cost. Therefore you should be able to insert addresses easily and the device should give you the estimated time and distance. It should also be able to be attached to your car easily.
     b) Three strengths:
        1. It has a much easier interface than maps. It is easier to find where you need to go and navigate along the way. You don't have to search the whole map. If you use the GPS system it will tell you exactly where you are and where you need to go.
        2. Before the interface was a little confusing when you had to turn to the next
street. It would give you a distance, but it's confusing about exactly when you had to turn. Now they changed the interface to say which road you had to turn on. For example, instead of saying turn in 200 feet it now says turn on Butterfield Rd.

3. To further the above example the new GPS systems now have voice commands. That way you don't even have to touch the screen so you can keep your eyes on the road.

c) Three weaknesses:
   1. When you are in the city and the streets are closer together the map is still a little hard to read. To improve that the street images should be made a little wider.
   2. The placement of the GPS system makes the usage of it a little difficult. You can either place it on a stand or place it on the windshield. I think both of those are dangerous. If you are clicking through the options and you are looking down you won't be concentrating on the road which is dangerous.
   3. The interface for typing in the address is touchscreen. The problem with that is when you type in the address there aren't any keys so you can't feel yourself type it in. That makes it difficult if you're not used to using touchscreen.

• Kindle
  a) Kindle is a book reader device. It is the technological advancement of a book. It can be used for educating people and so can be used in colleges. Therefore it should be easy to carry around and should be easy to read. You should have an easy interface to store different books and chose from different texts.
  b) Strengths:
     1. It has a scroll on the side so that you can scroll down without having to move another device. It's intuitive that it's a scroll because of the way it looks.
     2. It mirrors the look of a printed book and so people will like it since it's intuitive and it's what people are used to.
     3. It's screen enables you to read in low light.
  c) Weaknesses:
     1. There isn't a mouse and so you don't have access to move around the page. It's difficult to highlight the text using buttons instead.
     2. Unlike a book there's no way to put a bookmark to save your place in the book. You just have to be able to remember where you read up to.
     3. You can't make notes in the margin like you would in a book. There's no interface available to save the notes that you make.

2) Person1:
   • They have the problem where they click on something and nothing happens. There is just an icon that implies something is going but they don't know what. This just gets them frustrated because they don't know if it's doing the right thing. So they just click what they want to happen again just in case. This just increases the time it takes for their application to start up. To reduce this effect there should be some sort of message if something takes longer than usual. Maybe also the icon of the application they are trying to open should be highlighted.
   • When using GPS they have the problem that it keeps rerouting when they don't want it to. So the directions keep on changing so they can't keep track of where
they are. This gets them especially frustrated since they need directions dynamically and they don't have time for the system to reroute itself and then undo the rerouting. There should be a message box that comes up asking if they want to reroute or not.

- People have the issue with the laptop being really heavy to carry around with especially when they need to take it to class and to the library. To solve this problem you would need to make the laptop's lighter.

Person 2:
- This person had a lot of issues with the wireless. When working with the wireless he said that a generic error would keep coming up when there was a problem with the wireless-independent of what was wrong with it. This was frustrating when trying to fix the problem. To fix this error messages should be as specific as possible.
- This person also had an issue with the heavy laptop. He said that when you have your laptop and heavy books as well your backpack can get too heavy. Again lighter laptop would solve the problem.
- This user also had a problem with the all the buttons on the top of the keyboard-F1-F12. He doesn't know what these buttons actually do. He knows to use them you have to combine them with other keys-like alt and ctrl and he sometimes uses the wrong combinations and loses his work. (He gets really mad when this happens-obviously!). To improve this you may need to label the buttons kind of like a calculator does. However this could get confusing since there are many combinations that are used.

Person 3:
- This person just got a new laptop and so she is just getting used to it. Her buttons are smaller than her previous ones and so she feels like it's harder to type. It would be good to test that the buttons are at easily usable with an average person's hand first.
- She also feels like her mouse pad is really sensitive. She tries to drag things or just brushes it and it clicks something and she loses where she is.
- She never had a Mac before so getting used to the interface is hard. For example it took her sometime to figure out where all the applications where found. It would be better if there was some more labeling involved so users know where to find program's they are looking for.

3) From below you can see that the learning constant is 0.2072. As you can see that as the trials increased the time taken to complete the task decreased. Some of the tactics that the user used was to write it out and then just look at it while they typed. There are a few variations with the results because they were talking to me or talking to people around them then.
Source Code:

```cpp
#include <iostream>
#include <fstream.h>
#include <string>
#include <time.h>

int main()
{
    double diff_time;
    time_t start,end;
    string input;

    fstream fout("Output File", ios::out);
    for(int i=0; i<20; i++)
    {
        cout<<"trial #"<<i+1;
        cout<<"Enter the last 8 letters of the alphabet backwards";
        time(&start);
        cin>>input;
        time(&end);
        diff_time = difftime(start,end);
        fout<<diff_time;
        fout<<"
    }
    fout.close();
    return 0;
}
```

```
4 )
\[ y = 14.27x^{-0.2072} \]
```

[Graph showing the relationship between trials and times with the equation \( y = 14.27x^{-0.2072} \)]
the use will probably look at half the list on average.

a) \[ MT = a + b \log (A/W + 1) \]
   
   \[ W = 14 \]

b) There are some limitations to his law. It doesn't account for outside stimuli. Like for question 3 above it doesn't account for outside distractions etc. Also if the user has a lot of things to process he may ignore some requirements or place more value on one thing than another. We cannot account for that in this law.