Ms Power Point vs Prezi in Higher Education

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ABSTRACT
The teachers use different presentation tools in Higher Education to make the presentation enjoyable for the students. I used MS Power Point or Prezi in my presentations in two different groups of the freshmen students at the University. The aim of this research was an analysis of the paper results in two groups of students to reveal the influence of the used presentation tool on the paper results of the students. The students have to write two papers in a semester to show how well they have learned the learning material. I used Prezi in the first group and MS Power Point in the second group before the first test and MS Power Point in the two groups before the second test. My starting hypothesis was that the group where I used the Prezi as a presentation tool would achieve better results in the papers. After the evaluation of the first paper results the correctness of the original presumption seemed to be proved. Significance level was 5% through the analysis. It was found significant divergence in the knowledge of the students. The students could get half mark better paper results when they followed the flash based Prezi presentation. I evaluated the second paper results too, before I used same presentation tool (MS Power Point) and I did not find difference in the paper results of the students in this case. Consequently, the use of the Prezi as a presentation tool is productive; the students get better results when writing papers.

INTRODUCTION
I teach Computer Science at the University and I have teaching experience in different subjects. The freshmen students of the undergraduate course Introduction to Informatics get acquainted with computer architecture, operating system, computer network and data encryption in history as well as with up to date applications. I used different didactical methods to make students get better paper results (Kiss, 2005, Kiss 2010, Kiss 2012a). One of my colleague use E-learning for help the practical training (Ambrus at al., 2012) and I have soma experience in web-based education (Kiss 2012b, Kiss 2012c).

We can find lot of presentation tool what teachers use to make the presentation enjoyable for the students and these tools have different repository of visual effects (Savasci Acikalin, 2011). Earlier I used the MS Power Point in Computer Science Education as a presentation tool. Some years ago I became acquainted with Prezi which is a flash based presentation tool with other visual effects than MS Power Point and Keynote (Prezi). The visitors of Prezi presentation listened to the speaker with more motivation. The reason can be that Prezi gives an endless whiteboard in the hand of speaker, where we can drop pictures, tables, texts, frames and we can rotate, zoom in/out during the presentation (Fig. 1.)

I want to see if I use Prezi as other presentation tool in the Higher Education could I find difference in the paper results of the students in this case or not.

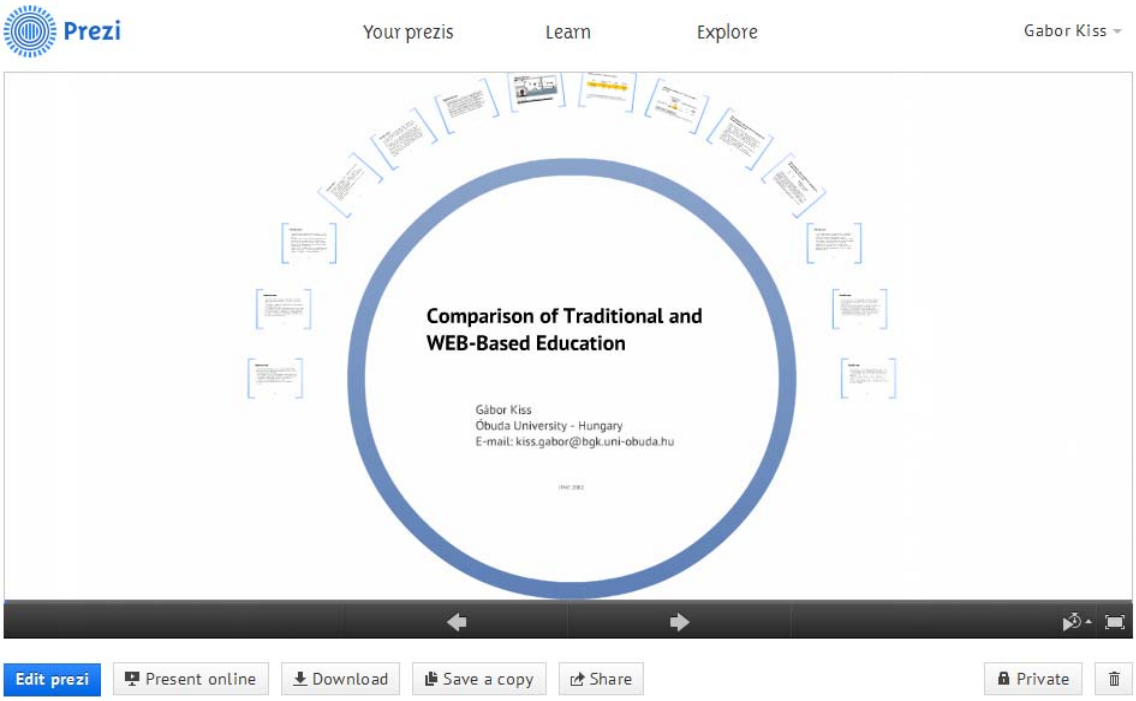

Fig. 1. Website of my own Prezi

ANALYZING OF THE PAPER RESULTS

The Number of Participants in the First and Second Test in the Two Groups and the Values of Mean and Std. Deviation

The students have to write two papers in a semester to show how well they have learned the learning material. I analyzed the first and the second paper results of the students during the first semester and made two groups. The students who visited the Power Point based lessons from week to week to follow the presentation were in the first group (group A) while the students who took part in Prezi presentation were in the second group (group B). After the first test both groups followed Power Point based presentation.

Table 1. Group statistics of first and second test results

Test	Group	Number of participants	Mean	Std. Deviation	Pass the test
First	A	320	1,61	0,76	46%
	B	378	2,26	0,85	81%
Second	A	276	1,53	0,77	39%
	B	364	1,76	0,74	59%

According to the table (Table 1.) the mean of the results of the first papers of group B is higher. It means this group wrote the papers with a better result. It does not give enough information to state that the use of Prezi-based education results in better written tests because this can happen accidentally, too. So, we needed more analyzing to keep the chance of accident low. If we spend more time looking at this table, we can see ~81% of the mechanical engineers who took part in the Prezi-based education could pass the test and the students who used the traditional way of education passed the test in lower percent (~46%), but we still do not know if it is a coincidence. The situation is not so clear by the second test result. There we do not see big difference by the means and by numbers of successful test. We found lower difference between the groups if the presentation tool was same.

Independent Samples test of First and Second Papers

My null hypothesis was that the results of the first paper written by the two groups of students would not differ significantly. Since we have two independent samples, we can use the T-test to tell if the means of the first paper of these groups differ or not. An analysis of the first test results of the students showed, the variance of two groups are same, because the value of Levene's test is not significant $F = 0,36$; $sig.=0,55$; ($p<0,05$).

In this case the means could be compared with Independent Samples T-test, which showed up a difference between the means (Levene, 1960), because the value of T-test is significant $t=-10,64$; $sig.=0,00$; ($p<0,05$). It means the use of the Prezi as presentation tool had influence on the results of papers of the students.

The null hypothesis was same in case of second paper written by the two groups of student. The second test results of the students showed, the variance of two groups are same, because the value of Levene's test is not significant F = 0,60; sig.=0,44; (p<0,05).

In this case the means could be compared again with Independent Samples T-test, which showed up a difference between the means, because the value of T-test is significant t=-3,78; sig.=0,00; (p<0,05). It means the students of two group show different knowledge level by using same presentation tool too. In this case we need more analyzing to see how strong the connection is between the grouping and the achieved result.

MEASURES OF ASSOCIATION BY THE PAPER RESULT

Earlier, significant differences could be detected between the means of the first papers written by the students. It means it is profitable to make a deeper analysis to reveal the influence of the web-based consultation on the calculated means. I could reveal the influence with the calculation of the Eta-squared (η^2) (Cohen, 1973). For the calculation of the Eta-squared first we have to calculate the main mean $(\overline{\overline{x}})$ (Eq. 1),

$$\overline{\overline{x}} = \frac{\sum_{j=1}^{m} n_j \overline{x}_j}{\sum_{j=1}^{m} n_j} \qquad \text{(Eq. 1)}$$

where n is the number of musters, is the mean of the musters and m is the number of musters.

After that we have to calculate the values of the variance Between-Groups Sum of Squares (SS_{Error}) (Eq. 2) and the variance Within-Groups Sum of Squares ($SS_{Treatments}$) (Eq. 3), where the standard deviation of musters (s_j) appears in the formula.

$$SS_{Error} = \frac{\sum_{J=1}^{m} n_j (\overline{x}_j - \overline{\overline{x}})^2}{\sum_{j=1}^{m} n_j} \qquad \text{(Eq. 2)}$$

$$SS_{Treatments} = \frac{\sum_{j=1}^{m} n_j s_j^2}{\sum_{j=1}^{m} n_j} \qquad \text{(Eq. 3)}$$

The Total Sum of Squares (SS_{Total}) is the summation of the variance between groups and the variance within groups (Eq. 4).

$$SS_{Total} = SS_{Error} + SS_{Treatments} \qquad \text{(Eq. 4)}$$

The following table shows the calculated values (Table 2).

	SS_{Error}	$SS_{Treatments}$	SS_{Total}
First test	73,49	451,76	525,24
Second Test	8,12	362,71	370,83

Table 2. Calculated values of variances

The value of the Eta-squared (η^2) is the quotient of the variance between groups and the total deviation quadrate (Eq. 5).

$$\eta^2 = \frac{SS_{Treatments}}{SS_{Total}} \qquad \text{(Eq. 5)}$$

The calculated value shows in percentage how much the grouping influences the difference between means. Square root from the Eta-squared (Eq. 6) gives a value between 0 and 1 (η),

$$\eta = \sqrt{\eta^2} \qquad \text{(Eq. 6)}$$

This shows the measures of association, how strong the connection is between the grouping and the achieved result. The more achieved, the stronger the connection (Cohen, 1988). In the next table we see the calculated values and the strength of the connection (Table 3.).

Table 3. Measures of Association

	η^2	η	Strenght of the connection
First test	14,0 %	0,37	middling weak
Second Test	2,2 %	0,15	no connection

When calculating the Eta-squared the effect of presentation tool on the result of the first test was put in the formula in percents. The result is showing the influence of presentation tool on the calculated means middling weak. This is meaning a middling weak correlation between the used presentation tool and knowledge level. Calculating the Eta-squared I tried to make the effect of the presentation tool on the result of the first papers written percentable and got 14%. This means there is a middling weak correlation existing between using the Prezi and the results of the first papers written by the students. We can remember the students who took part in the Prezi-based presentations could pass the test in higher percent (81% vs 41%).
On the other hand no connection by second test was found. It means when I used same MS Power Point by both groups, do not have influence of the presentation tool on the calculated means.
Consequently, the use of the Prezi as a presentation tool is productive; the students follow the presentations with more motivation and get better results when writing papers.

CONCLUSION

After the analysing process we can say my starting hypothesis is correct; students get better paper results by using Prezi as a presentation tool. The students could take advantage of this tool before the first test and could get a ~half mark better paper results when they took part in the Prezi-based presentations and the number of the students who could pass the test almost doubled.

In this research we could observe that the students are more motivated to take part in a Prezi-based lesson because it is a new way of presentation with different visual effect.
We can declare the use of Prezi as a presentation tool is useful for students and teachers as well.

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