How to mitigate students' resistance to Active Learning; the role of the lecturer
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Introduction

Research has shown that active learning techniques improve students' learning outcomes. However, recent research indicates that students do not recognize the added value of this pedagogy and may even resist to participate in active learning activities. Active learning (AL) requires more effort from the students to study and interact with the course materials. To stimulate this new learning behavior, digital tools are being developed that reward students to exhibit the required learning behaviors, even for large groups. In this study we will look at how the lecturer can improve students' motivation to participate in an online collaborative annotation tool, using positive feedback.

● Perusall – active learning tool

=> Perusall is a digital collaborative annotation tool that facilitates students' preparation and discussion of the course materials before class.

=> The tool grades the (active) participation of each student in and contribution to the online discussion, based on different study behaviors.

● The role of positive feedback

=> According to self-determination theory (SDT) extrinsic rewards can undermine student's intrinsic motivation to learn, also called the 'crowding out' effect by behavioral economists.

=> This happens when these rewards are controlling. The granular grading system of Perusall may be perceived as controlling.

Could the lecturer play a mitigating role in this?

=> 'positive feedback' is the only reward that is not perceived as controlling and impacts intrinsic motivation positively, according to SDT.

=> 'intangible rewards' also have a stronger effect on people's behavior according to behavioral economists.

We **hypothesize** that positive feedback from the lecturer will enhance students' motivation and perception of AL activities like Perusall and may enhance their actual AL behaviors.

● Method: experimental setup

Setting: master's course with 144 business students. 10 Perusall assignments; 2 articles per week for 5 weeks. The average Perusall grade counts for 10% of the final course grade.

=> After 2 weeks half of the students(74) received positive feedback from their lecturer per mail, the other half (70) did not.

=> 3 surveys were sent to the whole group: 1) background data, 2) after the experimental treatment about Perusall perception & motivation, 3) at the end about Perusall & course evaluation.

Results

The results showed that both groups did not differ on any of the relevant background variables.

● Effect on motivation & perception

Structural equation modelling (Amos) was performed, see figure 1. Also, different evaluation measures were compared between the two groups.

=> Positive feedback influenced the intrinsic motivation to participate in the Perusall app. This was fully explained through the improved perception of autonomy. It did not influence students' extrinsic motivation, nor any of the other motivational drivers.
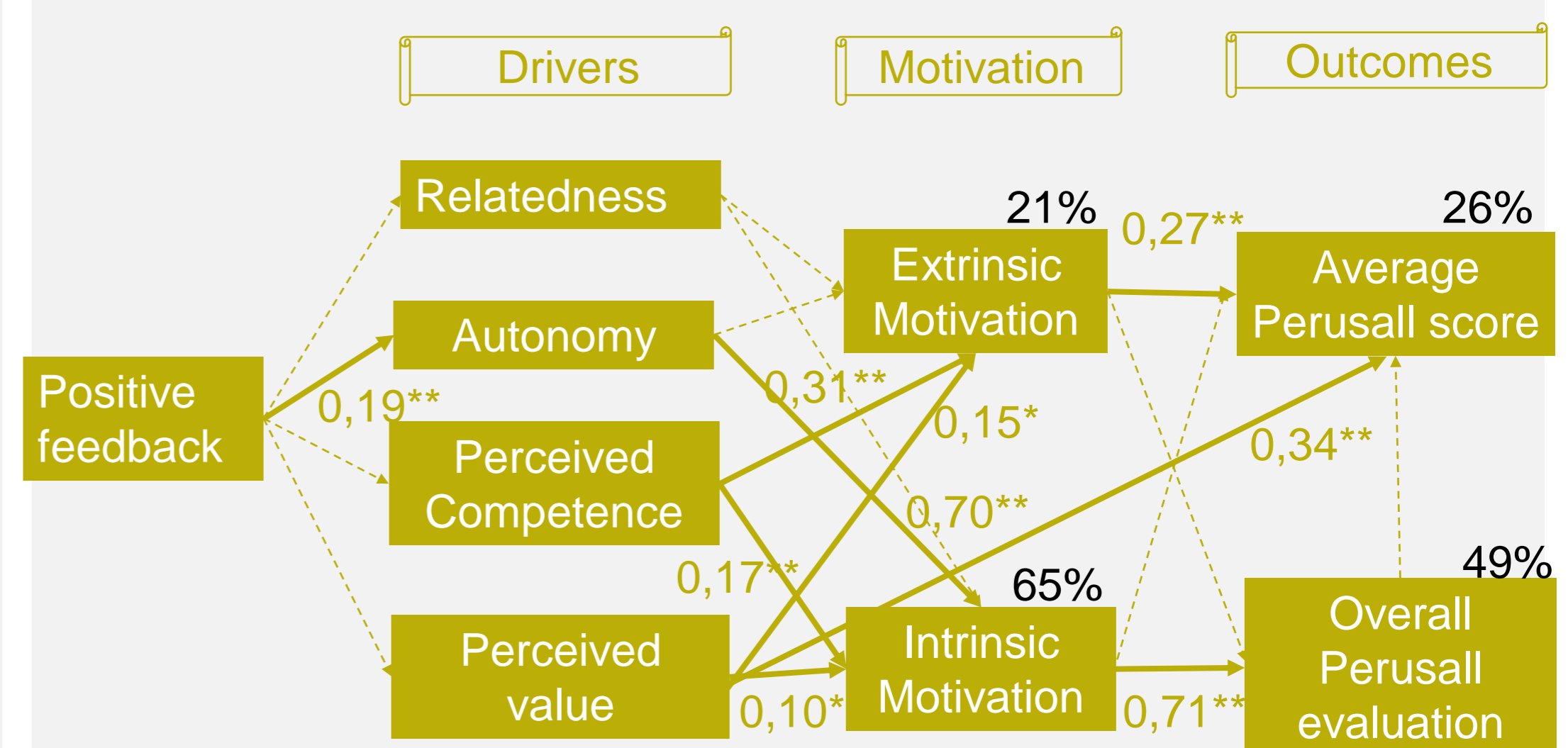

Figure 1: Outcomes sem model

** = significant at 5%
* = significant at 10%
--- = not significant

=> The evaluation scores show that the experimental group perceived an equal amount of additional effort and time to prepare the articles, but they experienced a significantly higher level of fun and motivation in doing so compared to the control group.

● Effect on behavior

Interestingly, figure 1 shows that there was no improved performance on Perusall for the experimental group – nor did they show higher learning outcomes on the exams. The behavior is influenced only by extrinsic motivation and perceived competence, not by students' intrinsic motivation nor the Perusall experience.

Conclusion

This study shows that the lecturer can (still) make a difference while more and more digital learning tools are developed to improve students' active learning. It seems that the build-in incentives in the tools are working well to stimulate students' AL behaviors as such, however, students' perception and motivation to use these tools are not as positive. The mere provision of positive feedback by the lecturer can mitigate students' resistance to active learning and improve their perception of autonomy as well as the intrinsic motivation to exhibit AL behaviors.