

# The Influence of Self-efficacy and Goal Orientation on Learning Behavior: The Intervening Role of Feedback

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The Influence of Self-efficacy and Goal Orientation on Learning Behavior:  
The Intervening Role of Feedback

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# **The Influence of Self-efficacy and Goal Orientation on Learning Behavior: The Intervening Role of Feedback**

## **Introduction**

When students have trouble carrying out an assigned task, teachers often wonder whether they lack the skills needed to successfully execute the task or whether they lack the personal belief that they are able to execute the behavior required to achieve the desired outcomes (i.e. *self-efficacy*). If it is the former, teachers can make use of their repertoire of teaching techniques, but for the latter it is not always clear how they can influence the students' specific mindset.

How students approach a task can vary greatly. They can invest much or little effort, feel confident or insecure, be convinced that the skills that they need can be developed or that they are destined to never master those skills, be anxious that they will make mistakes or be overconfident, think that their intelligence is fixed no matter what they do or that they can do anything if they set their mind to it, et cetera. This state of mind is called the *goal orientation* and is expressed in terms of which goals can be achieved and how. Both self-efficacy and goal orientation affect the student's learning behaviors, for example their effort, persistence, approach, avoidance, problem-solving strategies, and exertion of control (Bandura, 1997; Bandura & Schunk, 1981; Elliot, 1999, 2001; Zimmerman, 2000). The learning behavior that students displays affects their learning outcomes.

The following experiment of Collins (1982; cited in Bandura, 1997) illustrates this. Collins selected children who judged themselves to be of high or low self-efficacy at each of three levels of mathematical ability. They were then given difficult mathematical problems to solve. Within each level of ability, children who had a stronger belief in their own self-efficacy were quicker to discard faulty strategies, solved more problems correctly, chose to

rework more of those they could not correctly solve and did so more accurately than children of equal ability who doubted their own self-efficacy. Children's academic successes and failures were partly unrelated to their mathematical performance. The results made clear that self-efficacy predicted interest in, and positive attitudes towards mathematics, whereas actual mathematical ability did not. In this experiment, it appears that the learning behavior (i.e., the choice to rework incorrect solutions) of students is influenced by the way they judge themselves at the beginning of the execution of a task.

For learners to perform optimally (1) learning tasks must be aligned with their abilities, (2) they need to feel confident that they can carry out the task (i.e., have a positive self-efficacy) under the condition that they have the necessary knowledge and abilities, and (3) they need to have a goal orientation that guides them to acquire the necessary knowledge and skills. While we know that feedback is a powerful tool with respect to learning and skill acquisition (Hattie & Timperley, 2007), it is not known whether feedback can influence self-efficacy and goal orientation. In this study, the relationship between self-efficacy, goal orientation and feedback is examined to influence the learning behavior corresponding to the state of self-efficacy and the adopted goal orientation. The ultimate aim is to influence learning behavior in order to increase learning outcomes.

### **Self-efficacy**

Learning is an ongoing process in which behavior is motivated and regulated by one's cognitions (Stevens & Gist, 1997). One set of cognitions is self-efficacy. Self-efficacy - extensively studied by Bandura (1977, 1997) - is the individual's belief in his or her capabilities to execute a behavior that is required to achieve prospective outcomes. There is a difference between knowing that one has the knowledge and skills to reach a goal or achieve a result (i.e., one's competence) and the belief that one can achieve a certain result (i.e., one's self-efficacy). Self-efficacy is "people's beliefs about their capabilities to exercise control

over events that affect their lives” (Bandura, 1989, p. 1175). He made clear that even if individuals believe that outcomes can be influenced by behaviors or responses, they will not attempt to exert control unless they also believe that they *themselves* are capable of producing the requisite responses or behaviors. Chan and Lam (2010) visualized this relationship (see Figure 1).

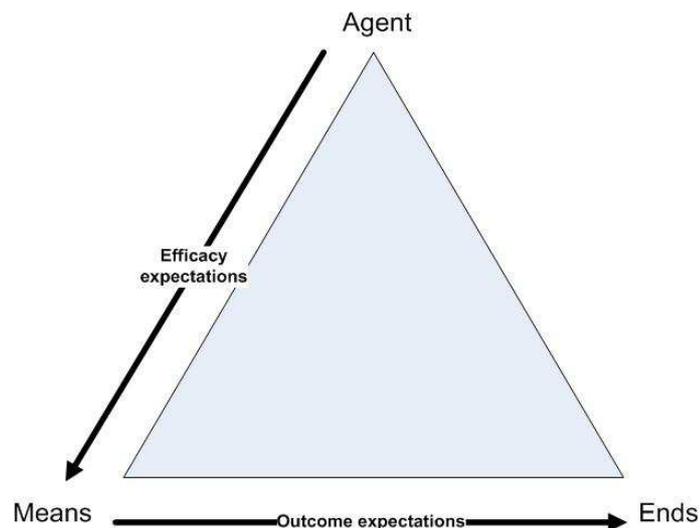


Figure 1: Relation outcome expectations and efficacy expectations (Chan & Lam, 2010)

Outcome expectations are an individual’s estimates that a certain behavior (i.e., the means) can achieve the desired outcomes (i.e., the ends) whereas efficacy expectations are an individual’s beliefs of whether they (i.e., as agent) can produce the behavior (i.e, the means) which can produce the desired outcomes (i.e., the ends) (Bandura, 1977).

The degree to which a person believes she/he can produce a required behavior in a certain situation (i.e., her/his self-efficacy) is contextual, for example the belief that one can study in a noisy room and it depends on the domain that needs to be studied. A person can feel very self-efficacious on one domain but can have low self-efficacy in another. Several studies on the effects of self-efficacy show that a strong sense of self-efficacy enhances personal accomplishment (Bandura, 1997; Usher & Pajares, 2008; Zimmerman, 2000). People

with a strong sense of self-efficacy approach difficult tasks as challenges, become interested and deeply engrossed in activities, set challenging goals and maintain strong commitment to them. They maintain a task-diagnostic focus that guides effective task performance and which heightens and sustains their efforts in the face of failure. They attribute eventual failure to insufficient effort on their part, which can be remedied by increasing their effort and/or to a knowledge/skills deficiency which they then assume they can acquire. They quickly recover their sense of self-efficacy after failures or setbacks and approach threatening situations with the assurance that they can exercise control over those situations. Students who doubt their capabilities show an opposite reaction (Bandura, 1997).

Self-efficacious students are willing to take on more challenging and difficult tasks than students with low self-efficacy (Bandura & Schunk, 1981). Self-efficacy has also been shown to be predictive for student effort with respect to both the rate of performance and the expenditure of energy. Its influence on persistence is both direct (i.e., the methods used to learn) and indirect (i.e. the motivation to learn) (Zimmerman, 2000). Zimmerman also points out that self-efficacy provides students with a sense of agency; that is the student's sense that she/he is the one causing or generating an action (Gallagher, 2000) rather than someone else such as a teacher, peers, and so forth.

As self-efficacy appears to influence student performance, it could be beneficial to determine if and how a learner's self-efficacy can be influenced. To determine how self-efficacy can be influenced it is necessary to understand where self-efficacy is derived. To do this, it is important to understand the sources of self-efficacy. Usher and Pajares (2008) distinguished four factors that affect self-efficacy:

1. **Mastery experience:** After completing a task, students interpret and evaluate the results obtained and judge or revise their competence. Successful mastery

(i.e. effort leading to the desired result) enhances self-efficacy beliefs. This seems to be the most powerful source of self-efficacy.

2. Vicarious experience: One's abilities are judged in comparison with the results of other students. If a student is as successful or more successful than other students, then value can be added to the own performance. These experiences have an evaluative character.
3. Verbal and social persuasion: Feelings of self-efficacy can be enhanced by encouragement from parents, teachers, and peers whom students trust. These persuasions may be limited in their ability to create sustainable increases in self-efficacy.
4. Emotional and physiological state: Physiological arousal during activities is, for students, an indicator of competence. Bandura (1997) suggested that people function optimally when their physiological arousal is neither too high nor too low.

In summary, self-efficacy has an effect on the learning behavior of a student in terms of the choice of activities and tasks, the level of invested effort and the persistence of the learner in pursuing a task. The main source of self-efficacy is the mastery experience (Usher & Pajares, 2008) and evaluation of the results obtained has a major influence on a person's sense of self-efficacy in a new upcoming situation. The learning outcomes affect the sense of self-efficacy in a new situation. It can be assumed that the relation between self-efficacy, learning behavior and learning outcomes is a continuous ongoing process (see Figure 2).

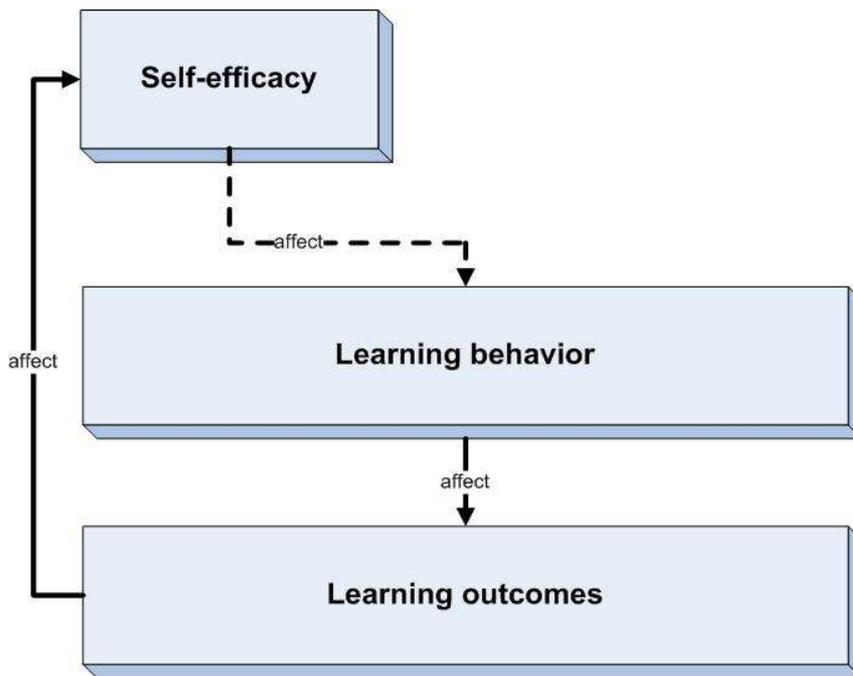


Figure 2: The relation between self-efficacy, learning behavior and learning outcomes

### Goal Orientation

Another important set of cognitions that affect learning behavior is one's goal orientation (Stevens & Gist, 1997). In the way people learn, different approaches can be distinguished. Some people study to get good grades or a better position while others study 'just' to get good or better at something. If the goal orientation is one in which someone strives to good grades, then one speaks of a performance orientation. When the goal orientation is one in which someone strives to get good or better in something then one speaks of mastery orientation. Mastery and performance orientation are defined as a function of competence. The way competence is valanced adds another classification of goal orientation: an approach or avoidance orientation (Elliot, 2001). When students expect a positive, desirable outcome, they will have the desire to achieve success. When a negative, undesirable outcome is expected, they will have the desire to avoid failure. Four types can be distinguished: mastery-avoidance, mastery-approach, performance-avoidance and performance-approach goal orientation (Elliot, 1999).

Each of these goal orientations leads to a certain learning behavior. Learning behavior that is aimed to avoid doing worse than one has done before (Van Yperen, Elliot & Anseel, 2009), to do better than one has done before, to avoid doing worse than others, to do better than others. Each achievement goal leads to achievement-relevant processes (i.e., learning behavior). Positive processes can be persistence, effort while studying, challenge-related affect while studying, deep processing of information, willingness to seek help with schoolwork, long-term retention of information, intrinsic motivation. Examples of negative processes are: threat construals, low absorption during task engagement, distraction while studying, less self-regulated learning, procrastination, unwillingness to seek help with schoolwork, wanting to escape evaluation, poor retention, poor performance and reduced intrinsic motivation (Elliot, 1999). So it can be assumed that the relation between goal orientation, learning behavior and learning outcomes is as shown in Figure 3.

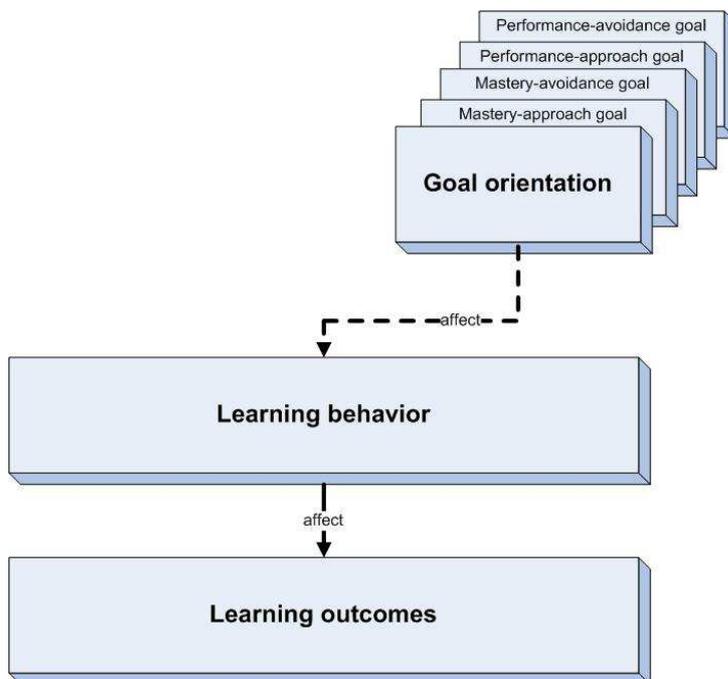


Figure 3: The relation between goal orientation, learning behavior and learning outcomes

## Self-efficacy and Goal Orientation

Both goal orientation and self-efficacy affect learning behavior. Learners with a performance goal orientation experience impending failure as a threat to success and set up defences to protect themselves. Self-efficacy influences in what way people approach tasks, foster interest and deep engrossment in activities, set goals and stay committed to them. The relationship between self-efficacy and goal orientation will be investigated in order to determine in which way both concepts influence each other, and in the end to determine how both can be influenced in a way that the learning outcomes will increase. Self-efficacy may facilitate adoption of a certain goal orientation (Stevens & Gist, 1997). According to social-cognitive theory (Bandura, 1989), individuals' perceptions of self-efficacy impact many aspects of people's lives including their goals (Caraway, Hall, Reinke, Tucker, 2003). It is hypothesized that self-efficacy is a predictor of the adoption of a specific goal orientation, Figure 4.

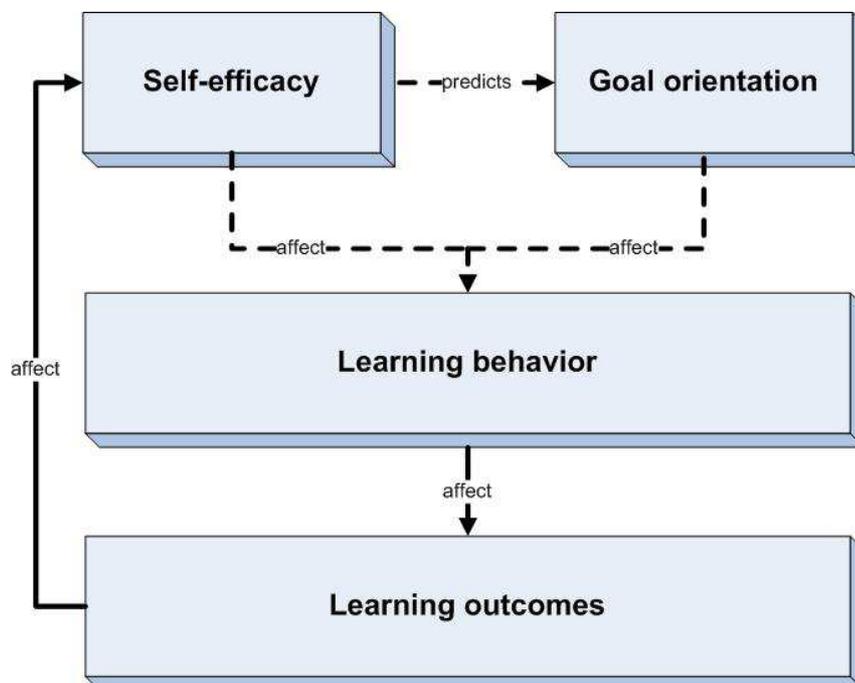


Figure 4: The relation between self-efficacy, goal orientation, learning behavior and

learning outcomes

## **Learning behavior**

The concept learning behavior is a very broad concept. In this study it is assumed that both self-efficacy and goal orientation affect the student's learning behaviors, for example their effort, persistence, approach, avoidance, problem-solving strategies, and exertion of control (Bandura, 1997; Bandura & Schunk, 1981; Elliot, 1999; Elliot & McGregor; 2001; Zimmerman, 2000). Both self-efficacy and goal orientation have been associated with learning strategies such as deep learning and surface learning (Liem, Lau, & Nie, 2008). According to the model of Elliot it is assumed that self-efficacy exerts a direct effect on achievement goals, which in turn serve as a proximal precursor to achievement related processes and outcomes. Both Liem et al. and Fenollar, Román & Cuestas (2007) found positive structural paths: self-efficacy → mastery goals; mastery goals → deep learning approach; deep learning approach → achievement in English. Biggs (1987) characterized deep learning as elaborating ideas, thinking critically and linking as well as integrating one concept with another. Surface learning is characterized by such strategies as memorization and reproduction of the learning materials. Biggs, Kember & Leung (2001) state that it is important to realize that measuring deep and surface approaches is influenced by the context and the task. It would be inappropriate to conclude that a student has a deep or surface approach to learning as if that would be a stable trait.

## **Feedback**

Feedback can be a powerful instrument to improve learning through influencing learning behavior. However, it is also a complex instrument for which many moderators have been researched and reviewed. Feedback in the broadest sense has been subject of many studies. Kluger and DeNisi (1996) and Hattie and Timperley (2007) define feedback as actions taken by one or more external agent/agents to provide information regarding certain

aspects of one's task performance. Kluger and DeNisi emphasise in their definition that it is about intentional interventions by an external agent. In other words, conscious interventions by an external agent and not by the learner her-/himself. However, Hattie and Timperley indicate that feedback can also be given by external agents but can also be sought by students and be detected by learners without being intentionally sought. According Hattie and Timperley, it is important that feedback is delivered in a learning context and that it should address faulty interpretations, not a total lack of understanding.

In 1998, Hattie and Jaeger stated that feedback refers to subsequent information aimed at assisting the learner meeting the goals of the learning process. The information provided as feedback differs from the information provided by the instruction itself because it involves subsequent information in the learning process. Shute (2008) defined formative feedback as information communicated to the learner intended to modify the learner's thinking or behavior for improving learning. The addition of the word *formative* feedback emphasises that the feedback is targeted at improving learning efficiently and expediently (Sadler, 1989, p. 120)

The contribution of feedback to the learning process and by extension to learning outcomes, depends on the focus of feedback and the level at which it is directed. Several mediating variables influence the effectiveness of feedback such as the ultimate aim of feedback interventions, the learning context, the personal characteristics of the students and the mediating variables (Hattie & Timperley, 2007). Further, effective feedback can only be provided by an agent who is aware of the goals to be achieved and the impact of the different actions she/he undertakes. It is necessary to find out and pay attention to which feedback intervention increases performance and under which conditions. Following Hattie and Timperley, the main purpose of feedback is to reduce discrepancies between current understandings or performance and a goal.

### **Feedback as Tool to Influence the Adoption of a Specific Goal Orientation**

The relationship between goal orientation and feedback seems to be mutual. On the one hand the goal orientation of learners determines the way they perceive feedback. A mastery goal oriented learner sees feedback based on the need to learn and develop skills. A performance-avoidance goal oriented learner might interpret feedback as a threat depending on the way the feedback is delivered. On the other hand, feedback may influence the learner's goal orientation. Assuming a particular goal orientation and its associated characteristics, feedback can be used to alter the goal orientation of a learner. Farr (1993), for example, found that with a mastery goal orientation, there is a tendency to view feedback as useful, in that it is seen as providing diagnostic information about how to correct errors and develop the competencies needed for task mastery. With a performance goal orientation, however, feedback is viewed as an evaluation and judgment about the self revealing one's competency level / lack of competence (Bobko & Colella, 1994; Kanfer, 1990). Negative feedback can be especially devastating when one holds a strong performance goal orientation because such an unfavourable judgment conflicts with the goal of appearing competent (VanderWalle, 2003).

Mastery goal orientation leads, in case of impending failure, to more effort because mastery goal oriented learners believe that effort is the key to success. Learners with a performance goal orientation, in contrast, experience impending failure as a threat to success and set up defences to protect themselves. Hoska (1993) explains that the goal orientation of learners becomes critical when they perceive impending failure. Hoska (2003) states that if a learning situation is structured to foster a particular type of goal, learners will respond in kind. In fact, she claims a learner's goal orientation can be temporarily and, over time, permanently altered by intervention. Feedback is an intervention to alter the learners' goals. Hoska assumed that the learners' goals can be altered by:

- Changing the learners' view of intelligence: Feedback can help learners view intelligence in a way that helps them see that ability and skill can be developed through practice, that effort is critical to increasing this skill, and that mistakes are part of the skill-developing process.
- Modifying the goal structure of the learning task: Competitive, cooperative and individualistic environments influence the goal orientation of learners in different ways. Competitive environments cue learners that performance should carry the most incentive, cooperative environments cue learners that the task is important and that achieving mastery goals can be fostered. Individualistic environments will not necessarily be task-focused but their orientation will be determined by the reward system of the learning experience.
- Controlling the delivery of learning rewards. Feedback in the form of external rewards, unwarranted praise, unrequested help and performance comparison stimulates the focus on ability and consequently fosters performance goals. Emphasis on developing skills and gaining knowledge stimulates focusing on the task and consequently fosters mastery goals.

According to Hoska (1993), feedback interventions that alter the goal orientation into a mastery or performance-approach goal need to be aligned to: the learners' view of intelligence, the environment and the focus on developing skills and gaining knowledge. The research that will be carried out hypothesizes that feedback focussed on the learners' view of intelligence and on developing skills and gaining knowledge can alter the goal orientation of students from performance-avoidance oriented to mastery or performance-approach oriented.

### **Feedback as a Tool to Enhance Self-efficacy**

In this study the concept of self-efficacy is delimited and based on the features of low and high self-efficacy. The intended purpose of this study is to alter the learners' perceptions

of low self-efficacy into high self-efficacy. In a learning situation, it is desirable that students approach difficult tasks as challenges, that their interest and deep engrossment in activities is fostered, and that they set challenging goals and maintain strong commitment to them. To achieve this desired situation this research will examine how feedback can and should be used to enhance self-efficacy. Based on the research described earlier in this paper, the feedback interventions should focus on the four sources of self-efficacy (i.e., mastery and vicarious experiences, verbal and social persuasions and emotional and physiological states)( Usher & Pajares, 2008). Feedback might be useful by giving meaning to the experiences (mastery and vicarious) after a task is completed. The general sense of self-efficacy developed by these four factors can be influenced by the situation.

Self-efficacy will affect learning because it can influence how much effort (i.e., learning behavior) learners are willing to invest in a task (Mory, 2004). If one has the feeling that she/he can achieve something, then that person is more willing to invest the necessary effort. Mory points out that the level of effort can be increased by providing learners with experiences that are positive and internally satisfying, such as experiencing continually increasing levels of competence. Bandura (1977) too noted the importance of experiencing continually increasing levels of competence. He suggests the following approach:

- Provide support and help for learners when they are first learning a new skill. This can include both encouragement and remedial techniques. Feedback can be a part of this support.
- As learners become skilled, gradually remove the support and feedback (i.e., fading).
- After learners have reached some level or knowledge of skill allow self-directed study.

As learners see that their effort yields increasing abilities, self-efficacy will increase. This gradual development of abilities is more effective in increasing learners' feelings of self-efficacy than constant levels of achievement when no progression/development can be experienced. Feedback will be supportive in the process of becoming more competent or skilled and at the same time influence self-efficacy when it occurs in an environment where students can experience continually increasing levels of competence. It is hypothesized that feedback focussed on increasing levels of competence and the process during the execution of a task will enhance learners' feelings of self-efficacy.

### **Conclusion**

It is not always possible to trace learning outcomes directly back to the skills and knowledge of students. The experiment presented in the introduction (Bandura, 1997) demonstrates how children approach a mathematic task (i.e., their learning behavior) and how they perform (i.e. their learning outcomes). It is striking to see that mathematical ability does not always lead to good learning outcomes: self-efficacy mediates the learning outcomes. In line with this mediating relation, aspects of learning behavior (e.g., choices made, degree of persistence, willingness to strive towards mastery, etc) can also be important mediating variables. The learning behavior affects the learning outcomes and is itself determined by self-efficacy and goal orientation. Better understanding of these relations in certain contexts might lead to understanding how to support students with a specific form of feedback to increase the learning outcomes.

Combining the assumed relations between these concepts in this paper leads to the model in Figure 5.

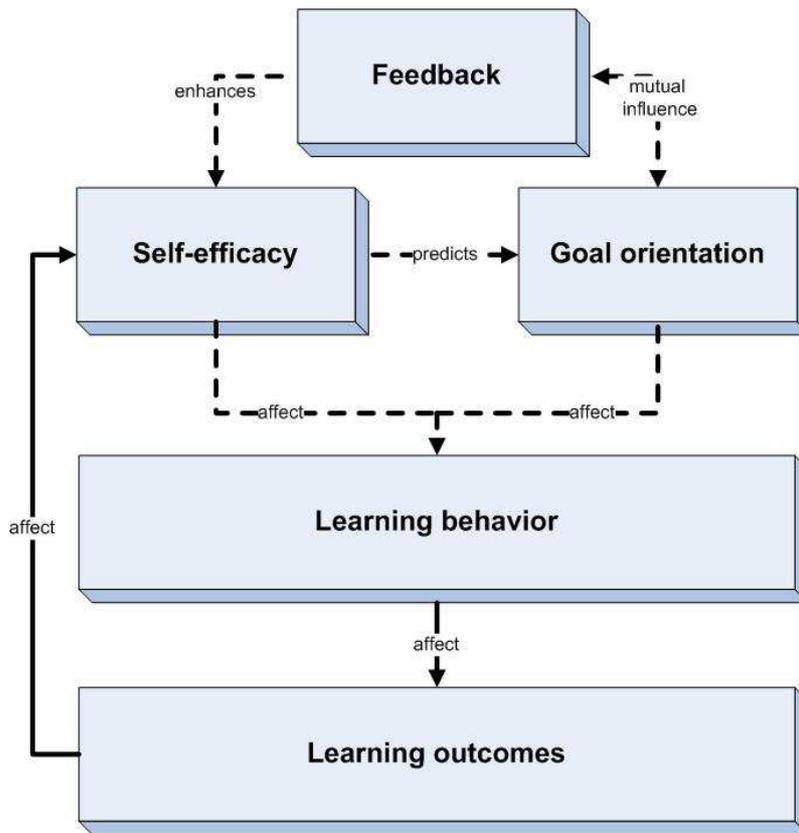


Figure 5: The relation between self-efficacy, goal orientation, feedback, learning behavior and learning outcomes (assumed relation ————, subject of research .....)

The model in Figure 5 is based on the following hypotheses:

- H1. Self-efficacy is a predictor of the adoption of a specific goal orientation.
- H2. Feedback focussed on the learners' view of intelligence and on *developing* skills and *gaining* knowledge, will alter the goal orientation of students from performance-avoidance oriented to mastery or performance-approach-oriented.
- H3. Feedback focussed on increasing levels of competence and the process during the execution of a task will enhance the self-efficacy of students.
- H4. When feedback focusses on enhancing self-efficacy and altering the goal-orientation from performance-avoidance oriented into mastery or performance-approach oriented of a student, learning behavior will change in a direction that leads to more effective learning behavior.

The overall research question is: What is the influence of feedback on self-efficacy and goal orientation? The ultimate aim is to influence learning behavior in order to increase learning outcomes. Experiments will be conducted to examine the relationship between self-efficacy, goal orientation and feedback to influence learning behavior corresponding to the state of self-efficacy and the adopted goal orientation. The goal of the first experiment is to investigate the relationship between self-efficacy and goal orientation and their effect on learning behavior. It is assumed that self-efficacy is a predictor of the adoption of a certain type of goal orientation.

## References

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of constant levels of achievementbehavioral change. *Psychological Review*, *84*(2), 191-215.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, *44*, 1175-1184.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New-York: W. H. Freeman.
- Bandura, A. & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology*, *41*, 586-598.
- Bobko, P., & Colella, A. (1994). Employee reactions to performance standards: A review and research propositions. *Personnel Psychology*, *47*, 1-29.
- Caraway, K., Hall, C., Reinke, W. M., Tucker, C. M. (2003). Self-efficacy, goal orientation, and fear of failure as predictors of schoolengagement in high school students. *Psychology in the schools* *40*(4), 417-427.
- Chan, J. C. Y. & Lam, S. (2010). Effects of different evaluative feedback on students' self-efficacy in learning. *Instructional Science* *38*(1), 37-58.
- Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist*, *34*, 169-189.
- Elliot, A. J., McGregor, H. A. (2001). A 2x2 achievement goal framework. *Journal of Personality and Social Psychology*, *80*, 501-519.
- Farr, J. L. (1993). Informal performance feedback: Seeking and giving. In H. Schuler, J. L. Farr, M. Smith (Eds.), *Personnel selection and assessment: Individual and organizational perspectives* (pp. 163-180). Hillsdale, NJ: Erlbaum.

- Gallagher, S. (2000). Philosophical conceptions of the self: Implications for cognitive science. *Trends in Cognitive Sciences*, 4(1), 14–21.
- Hattie, J., & Jaeger, R. (1998). Assessment and classroom learning: A deductive approach. *Assessment in Education*, 5(1), 111-122.
- Hattie, J. A., (1999, June). *Influences on student learning*. Inaugural professorial address, University of Auckland, New Zealand.
- Hattie, J. A., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77, 81-112.
- Hoska, D. M. (1993). Motivating learners through CBI feedback: Developing a positive learner perspective. In J. V. Dempsey & G. C. Sales (Eds.), *Interactive instruction and feedback* (pp.105-132). Englewood Cliffs, NJ: Educational Technology.
- Kanfer, R. (1990). Motivational and individual differences in learning: An integration of developmental, differential and cognitive perspectives. *Learning and Individual Differences*, 2, 221-239.
- Kluger, A. N., & DeNisi, A.(1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, 119(2), 254-284.
- Mory, E. H. (2004). Feedback research review. In D. Jonassen (Ed.), *Handbook of research on educational communications and technology* (pp.745-783). Mahwah, NJ: Lawrence Erlbaum.
- Pajares, F. & Usher, E. L. (2008). Sources of Self-Efficacy in School: Critical Review of the Literature and Future Directions. *Review of Educational Research*, 78(4), 751-796.
- Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science*, 18, 145–165.

- Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research*, 78(1), 153-189.
- Stevens, C. K. & Gist, M. E. (1997). Effects of self-efficacy and goal-orientation training on negotiation skills maintenance: what are the mechanisms? *Personnel Psychology*, 50(4), 955-978.
- VandeWalle, D. (2003). A goal orientation model of feedback-seeking behavior. *Human Resource Management Review*, 13, 581-604.
- VanYperen, N. W., Elliot, A.J., Anseel, F. (2009). The influence of mastery-avoidance goals on performance improvement. *European Journal of Social Psychology*, 39, 932-943.
- Zimmerman, B. J. (2000). Self-Efficacy: an essential motive to learn. *Contemporary Educational Psychology*, 25, 82-91.