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Emotions and Learning

by Reinhard Pekrun



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Series Preface

The present booklet entitled 'Emotions and Learning' has been prepared for inclusion in the Educational Practices Series, a publication developed by the International Academy of Education (IAE). As part of its mission, the International Academy of Education provides timely syntheses of research on educational topics of international importance. The booklets are published and distributed by UNESCO's International Bureau of Education (IBE). This is the twenty-fourth in a series of booklets on educational practices that have been shown to be positively related to learning.

The International Academy of Education is grateful to Professor Reinhard Pekrun for writing the present booklet. Dr Pekrun is holding the Chair of Personality and Educational Psychology at the University of Munich. He is well known for his research on the development of achievement emotions in children and adolescents, and across genders and cultures. Dr Pekrun has developed various assessment instruments to measure achievement emotions and has served as a member of the PISA Questionnaire Expert Group, co-responsible for the assessment of student characteristics and family environments within the PISA assessments. PISA is the acronym for the Programme for International Student Assessment launched by the Organisation for Economic Co-operation and Development in 1997. He has also contributed to the implementation of effective learning environments aiming to promote students' adaptive emotions and cognitive performance, particularly in the learning of mathematics.

The officers of the International Academy of Education are aware that this booklet is based on research carried out primarily in economically advanced countries and that the recommendations of this booklet need to be assessed with reference to local conditions and adapted accordingly. In any educational setting, guidelines for practice require sensitive and sensible applications and continuing evaluation of their effectiveness.

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Introduction

The classroom is an emotional place. Students frequently experience emotions in classroom settings. For example, students can be excited during studying, hope for success, feel pride in their accomplishments, be surprised at discovering a new solution, experience anxiety about failing examinations, feel ashamed over poor grades, or be bored during lessons. In addition, social emotions play a role as well, like admiration, empathy, anger, contempt, or envy concerning peers and teachers. Moreover, students bring emotions to the classroom that concern events outside the school, but can nevertheless have a strong influence upon their learning, such as the emotional turmoil produced by stress within the family.

All of these emotions can have important effects on students' learning and achievement. Emotions control the students' attention, influence their motivation to learn, modify the choice of learning strategies, and affect their self-regulation of learning. Furthermore, emotions are part of students' identity, and they affect personality development, psychological health and physical health. From an educational perspective, emotions are important because of their influence on learning and development, but students' emotional well-being should also be regarded as an educational goal that is important in itself.

This booklet addresses the emotions experienced by students at school. I discuss the nature and diversity of these emotions, their functions for students' learning, their individual antecedents, ways to regulate these emotions, and the influence of teachers, lessons, test-taking, peers and the family. From these discussions, I suggest guidelines about how teachers can understand students' emotions and what they can do to help students develop emotions that promote learning and development, and prevent emotions that are harmful.

All of the ten principles and all of the individual practical guidelines discussed in this booklet are based on empirical evidence. However, the degree to which guidelines on student emotions follow from firm evidence differs depending upon the emotion. Anxiety was the first student emotion that received widespread attention by educational researchers. Specifically, researchers focused on students' test anxiety (i.e. anxiety experienced before and during the taking of tests and examinations). The first empirical investigations of test anxiety were conducted in the 1930s. Since then, more than 1,000 studies on this emotion have been published. In this booklet, the reported research findings and practical guidelines related to students' anxiety are based on firm evidence derived from a large number of

studies. For emotions other than anxiety, the number and scope of studies is sufficient to establish the guidelines discussed in this booklet, but these guidelines are based on a smaller number of studies, and some of them may need revision in the future.

The booklet presents ten principles that are organized around three major issues.

- Principles 1 and 2 address the nature and diversity of students' emotions ('Understanding emotions'; 'Individual and cultural differences').
- Principles 3 to 6 address functions, antecedents, and the regulation of emotions ('Positive emotions and learning'; 'Negative emotions and learning'; 'Self-confidence, task values and emotions'; 'Emotion regulation').
- Principles 7 to 10 address the role of education in modifying emotions, including the influence of teachers, classrooms, schools, peers and the family ('Classroom instruction and teacher emotions'; 'Goal structures and achievement standards'; 'Test-taking and feedback'; 'Family, peers and school reform').

Suggested readings: Schutz & Pekrun, 2007; Zeidner, 1998.

1. Understanding emotions

Emotions profoundly influence learning and achievement. Therefore, pay attention to the emotions experienced by students.

Research findings

Research has shown that students experience many emotions during lessons, while studying, and when taking tests and examinations. These emotions can be positive or negative, and they can be intense and frequent. Some of these emotions are brought into the classroom from life outside the school. Many of them, however, originate within academic settings. Four groups of academic emotions are especially relevant for students' learning.

- *Achievement emotions* relate to achievement activities and to success and failure resulting from these activities. Examples are enjoyment of learning; hope and pride related to success; and anxiety and shame related to failure. Achievement emotions are pervasive in academic settings, especially so when the importance of success and failure is made clear to students.
- *Epistemic emotions* are emotions triggered by cognitive problems, such as surprise about a new task; curiosity, confusion and frustration about obstacles; and delight when the problem is solved. Epistemic emotions are especially important in learning with new, non-routine tasks.
- *Topic emotions* pertain to the topics presented in lessons. Examples are empathy with the fate of one of the characters portrayed in a novel, anxiety and disgust when dealing with medical issues, or enjoyment of a painting discussed in an art course. Both positive and negative topic emotions can trigger students' interest in learning material.
- *Social emotions* relate to teachers and peers in the classroom, such as love, sympathy, compassion, admiration, contempt, envy, anger or social anxiety. These emotions are especially important in teacher/student interaction and in group learning.

In the classroom

The emotions listed above can have a strong influence on learning and achievement. Therefore, it is important for teachers to understand, and to deal with the emotions experienced by students. You can use your own emotional experiences to understand what kinds of emotions your students may undergo—remember the memories of the

emotions you experienced yourself as a student. Alternatively, you can try to talk to your students about the emotions they experience. For example, group discussion in the classroom can be used to share emotional experiences.

However, be aware that any assessment of student emotions by educators can involve a conflict between the need to know more about students' emotions and the right of students not to disclose their emotions. Students may regard their emotional experiences as a private affair that they do not want to share. Specifically, this may be true for emotions that are closely related to students' self-esteem, such as shame about failing an examination.

Therefore, it may happen that you cannot easily assess your students' emotions. In fact, research has shown that teachers' judgements of students' emotions can be very different from students' self-view. By the middle elementary school, students have learnt how to control the expression of their emotions, including social rules about when to disclose or not to disclose emotions in the classroom.

To deal with this problem, build up a trustful relationship with your students enabling them to share their emotions. Also, you can use depersonalized self-report in which students do not disclose their identity. For example, you can use anonymous self-report sheets to get feedback if your students are excited or bored by your lessons. Alternatively, you can ask for the judgement of others, such as the student's parents. For example, this may be needed if you suspect that a student is suffering from high anxiety about a test that he or she does not want to talk about. Furthermore, a more systematic assessment can be performed by professional experts, such as school psychologists, who are trained to perform high-quality assessment of emotions. Generally, when using one of these options, care should be taken to achieve a reasonable balance between the need to help your students and the students' right to keep emotions private.

Suggested readings: Lewis, Haviland-Jones & Feldman Barrett, 2008; Pekrun & Linnenbrink-Garcia, 2012; Weiner, 2007.

2. Individual and cultural differences

Consider the individual and cultural uniqueness of students' emotions.

Research findings

Emotions involve subjective experiences that vary between individuals. Different students can experience different emotions, even in the same situation. For example, one student may be excited when doing today's homework assignment in mathematics, whereas another student feels frustrated. These individual differences can relate to culture, ethnicity, gender, school membership, and class membership. For example, research has shown that average test anxiety is relatively high in students from some East Asian and Arab countries, as compared with students from Western countries. It has also been shown that average test anxiety is higher in female than in male students.

However, the differences in emotions experienced by different students within one culture are larger than the differences between cultures. Similarly, the differences among female students, and the differences among male students, are larger than the differences between the two genders. The same is true for ethnicity, school membership and class membership. Most of the differences between students are due to the uniqueness of students' individual emotions and cannot be explained by group membership.

Students can also differ in how they react emotionally to different school subjects. For example, one student may enjoy mathematics but be bored by language instruction, whereas another student may be the opposite—bored by mathematics but enjoy languages. The emotions experienced in similar subjects (such as mathematics and science) are often similar, but the emotions experienced in dissimilar subjects (such as mathematics versus languages) can be quite different. The differences between emotions in different school subjects become larger as students progress in education and are most evident in high-school students. The reason for these differences is that students' self-confidence and interests often vary across different subjects. Therefore, emotions that are influenced by self-confidence and interest, such as enjoyment of learning or anxiety, can vary as well.

Finally, emotions can change over time. Emotional stability over time also differs between students. For example, some students tend

to always enjoy mathematics instruction, whereas others are more variable in their emotional reactions.

In the classroom

To understand emotions, it is important to know that emotions have both universal features and individual uniqueness. For example, when students enjoy a lesson, this is a pleasant experience for students around the world. However, the contents, intensity, duration and frequency of classroom enjoyment can differ between students and may even be unique to an individual student.

You should be aware of the fact that only a minor part of these individual differences can be explained in terms of culture, ethnicity, gender, schools or classrooms. Because emotional reactions can differ widely, even among students sharing gender and class membership, it is best to avoid stereotype phrases that relate to group membership, such as ‘girls are afraid of math’. It is more useful to pay attention to the uniqueness of each individual student’s emotions.

Furthermore, to understand students’ emotions, it is necessary to consider that emotions can vary across school subjects and time, even within each individual student. For example, it would be wrong to assume that students always experience similar levels of test anxiety across subjects. In fact, it is not possible to infer from a students’ anxiety in mathematics that the student would also be nervous about languages, or vice versa. Because the amount of anxiety can substantially differ between school subjects, it would be misleading to think of students as either being generally test anxious or not test anxious.

For these reasons, teachers should avoid using the stereotype that an individual student always reacts with the same emotion across different subjects and academic situations. It can be quite misleading to label a student as ‘anxious’, ‘bored’ or ‘enthusiastic’ based on his or her emotional reactions for one specific school subject. Instead, make use of students’ varying emotional reactions by identifying the specific tasks and situations that result in them enjoying lessons, and help students to build their capacity for experiencing positive emotions by identifying their specific emotional strengths.

Suggested readings: Goetz et al., 2007; Zeidner, 1998.

3. Positive emotions and learning

Promote students' enjoyment of learning.

Research findings

Positive emotions are emotions that are experienced as pleasant. Positive emotions can vary in terms of the physiological and cognitive activation (also called arousal) that is part of the emotion. Enjoyment, excitement, hope and pride are activating positive emotions, whereas relief and relaxation are deactivating positive emotions. For example, excitement increases physiological parameters of arousal, such as heart rate, whereas relaxation decreases such parameters. Positive emotions influence learning by affecting students' attention, motivation, use of learning strategies and self-regulation of learning.

Attention. Emotions draw one's attention towards the object of emotion. For example, if you are proud of a good grade in an examination, your attention is focused on this accomplishment. It follows that your attention is distracted away from current task performance. Therefore, positive emotions can reduce performance on all kinds of tasks that need attention, including most types of academic learning tasks.

However, an important exception is task-related positive emotions, such as enjoyment of learning and excitement about learning materials. These emotions focus attention on the learning task itself rather than drawing it away. When enjoying learning, the task is the object of emotion, making it possible that one's attention is fully focused on the task. Enjoyment can promote students' flow experiences during learning, such as deep involvement and complete immersion in the activity. By contrast, positive emotions that do not relate to the task can distract attention and reduce performance. For example, fantasies of winning an academic award or spending time with friends may be enjoyable, but can distract attention from one's current homework assignment.

Motivation. Activating positive emotions, such as enjoyment of learning, can increase students' interest and motivation. These emotions help to recollect positive memories and to appraise positively the value of tasks and one's competence to solve them. Enjoyment promotes students' interest in the learning material, as well as the intrinsic motivation to learn (i.e. motivation that is based on interest). By contrast, the effects of deactivating positive emotions are probably more complex. Pleasant relaxation and relief can reduce any motivation to continue making an effort, but can reinforce motivation to begin again with learning material later.

Learning strategies. Activating positive emotions help to employ flexible, creative and deep learning strategies. Examples are the elaboration of learning material (i.e. relating the material to previously learned material or material from other subjects); organization of learning material; and critical thinking. In contrast, deactivating positive emotions can reduce any systematic use of learning strategies.

Self-regulation of learning. Because activating positive emotions enhance flexible thought and action, they also promote students' self-regulation of learning, which requires flexible planning and monitoring of learning activities. Deactivating positive emotions probably do not have these positive effects on self-regulation.

In the classroom

The research findings imply that positive emotions can have profoundly positive effects on students' learning. However, this need not be true for all positive emotions. Specifically, positive task-related emotions, such as enjoyment of learning, focus students' attention on learning, promote their motivation to learn, and facilitate use of deep learning strategies and self-regulation of learning. Overall, you can expect these emotions to have positive effects on students' achievement. By contrast, positive emotions that do not relate to learning can draw attention away and lower performance, such as a student falling in love reducing his/her academic effort. Similarly, deactivating positive emotions, such as relief and relaxation, do not necessarily have positive effects.

Therefore, you can help students develop their motivation and acquire competencies by promoting their task-related positive emotions. Teachers should make an effort to promote students' enjoyment of learning and excitement about learning materials (see Principles 5 to 9), but do not rely on triggering positive emotions that do not relate to learning. It may not be sufficient that students just experience good feelings; rather, positive emotional experience needs to be linked to the task of solving cognitive problems and studying learning materials.

Suggested readings: D'Mello & Graesser, 2012; Linnenbrink, 2007; Pekrun et al., 2002.

4. Negative emotions and learning

Prevent excessive negative emotions, but also help students to use their negative emotions productively.

Research findings

Negative emotions are emotions that are experienced as unpleasant. Similar to positive emotions, negative emotions can vary in terms of physiological and cognitive activation (or arousal). Anxiety, anger and shame are activating negative emotions, whereas hopelessness and boredom are deactivating negative emotions. For example, anxiety makes your heart beat faster, whereas boredom reduces such signs of arousal. Negative emotions also influence learning by affecting students' attention, motivation, use of learning strategies and self-regulation of learning.

Attention. Negative emotions draw students' attention away from learning. For example, anxiety about failing an examination leads to concern about failure and its consequences, thereby reducing task-focused attention. Similarly, boredom during lessons allows students' attention to drift away and leads to day-dreaming instead. By reducing attention, negative emotions can undermine learning and achievement.

Motivation. The motivational effects of activating negative emotions are variable. Specifically, anxiety and shame reduce interest and intrinsic motivation, but can induce motivation to invest effort in order to avoid failure. This is especially true if the student is expecting to succeed. Negative epistemic emotions, such as confusion about a difficult cognitive problem, can also enhance motivation as long as the student still expects to solve the problem. In contrast, deactivating negative emotions, such as hopelessness and boredom, generally reduce students' motivation to learn.

Learning strategies. Activating negative emotions, such as anxiety and shame, can facilitate the use of rigid learning strategies like simple rehearsal and rote memorization of learning material. Deactivating negative emotions reduce any use of strategies and promote shallow processing of information.

Self-regulation of learning. Because negative emotions reduce the student's ability to use flexible thought and action, they also undermine their self-regulation. Instead, they can promote external regulation of learning. For example, anxiety can motivate students to rely on external guidance by teachers and parents.

In the classroom

The research evidence implies that negative emotions can strongly obstruct students' learning. Test anxiety, achievement-related hopelessness or boredom during lessons can lead students to withdraw attention, avoid effort, procrastinate in doing assignments, fail exams, and drop out of school. Negative emotions are a major factor explaining why many students do not live up to their potential and fail to pursue the educational career that would correspond to their abilities and interests. Moreover, these emotions also jeopardize students' personality development and health, and contribute to the high numbers of suicides among youth in many countries—both unsuccessful and successful.

Therefore, you should help students to prevent negative academic emotions, and to reduce these emotions if they occur, especially so if these emotions seem to be occurring with high intensity and frequency. However, you should also consider that negative emotions cannot always be avoided when learning, and that they can be used productively if suitable precautions are taken. Less intense versions of anxiety, self-related anger or shame can even promote learning if students are confident in their success, and some amount of confusion about cognitive problems can facilitate conceptual change and the development of more advanced knowledge structures within students.

Try to reduce excessive negative emotions in your students, but also create a classroom culture enabling students to use the energy provided by unpleasant emotions to promote their learning. The key to creating such a culture is to raise students' confidence in their ability to solve problems, to focus their goals on mastering the learning material, and to regard students' errors as new opportunities to learn rather than personal failures (for more details, see principles 5 to 9).

Suggested readings: Boekaerts, 1993; Turner & Schallert, 2001; Zeidner, 1998.

5. Self-confidence, task values and emotions

Promote students' self-confidence and interest in academic tasks.

Research findings

Emotions are influenced by many individual factors, including genetic make-up, physiological processes, early learning experiences, personal values and cognitive appraisals of one's ability. Among these factors, students' self-confidence and task values are of primary importance for their emotions.

Self-confidence involves positive perceptions of one's ability to solve academic tasks. Self-confidence provides students with a sense of being able to learn and succeed, but also with a sense of being responsible for failure. Regarding task values, interest-related values are based on students' interest in learning materials. These values are also called intrinsic task values. Attainment values pertain to the perceived importance of doing well, and utility values relate to the value of academic engagement for obtaining outcomes, such as praise by parents or recognition of a good job.

Self-confidence promotes students' enjoyment of learning, hope for success and pride about accomplishments. By contrast, lack of self-confidence increases anxiety and hopelessness. Boredom can be induced by high levels of self-confidence that are due to a combination of low task demands and high competencies, or by low levels of self-confidence resulting from a combination of high task demands and low competencies. For example, gifted students may experience boredom during lessons due to lack of challenge, whereas less able students may experience boredom because they consider tasks as too difficult.

Students' emotions also depend on their task values. Enjoyment of learning is experienced when the learning material is perceived as interesting and valuable. By contrast, boredom occurs when the material is uninteresting and has no personal value. The perceived importance of success contributes to success-related emotions, such as hope and pride, while the perceived importance of failure contributes to failure emotions, such as anxiety, hopelessness and shame. For example, if a student perceives achievement in mathematics as most important, he or she will experience more pride about success, and more anxiety and shame related to failure in mathematics than in subjectively less-important domains.

In the classroom

Promote students' self-confidence so as to help them develop positive emotions, reduce negative emotions and deal productively with negative emotions that cannot be avoided. Self-confidence can be increased by focusing students' attention on their strengths rather than their weaknesses. Failures can be regarded as opportunities to learn rather than indicators of inability. Students can be shown to attribute failures to lack of effort that is under their personal control, rather than to external factors or lack of ability. Other measures include providing high-quality instruction and mastery goal structures (see Principles 7 and 8), and avoiding high-stakes testing (see Principle 9).

Helping students to value learning is important as well. Specifically, it is important to promote students' intrinsic task values based on interest. Two important ways to foster these values are using tasks that relate to students' everyday life (called authentic tasks by some authors), and making clear to students how tasks that may seem less relevant in the short term can nevertheless be important for their life. You can emphasize the relevance of tasks by relating them to students' current life or to their aspired future life. Alternatively, you can let students learn for themselves how academic tasks relate to their life, for example, by writing essays about the link between these tasks and their future.

On the contrary, emphasizing attainment value and utility value can be a double-edged sword. Increasing the attainment value of academic achievement can facilitate positive emotions, but can also increase negative achievement emotions, such as anxiety. The reason is that both success-related emotions and failure-related emotions are promoted if achievement is perceived as important. If a student perceives good grades as critically important, he/she may experience excitement and pride when succeeding, but may also experience strong fear of failure before exams, as well as hopelessness and shame if the examination is a failure. Therefore, it is better to help students develop interest-related task values.

Suggested readings: Pekrun, 2006; Weiner, 1985.

6. Emotion regulation

Help students to regulate their emotions using reappraisal, competence development and situational change.

Research findings

Students can use various methods to encourage positive emotions and reduce negative emotions. Alternatively, for the regulation of negative emotions and stressful situations, the term ‘coping’ is used. Emotions can be regulated by directly changing their symptoms (emotion-oriented regulation) or by changing their antecedents (appraisal-, competence- and situation-oriented regulation).

Emotion-oriented regulation directly targets the emotion. Most methods of this kind address the physiological processes that are part of the emotion, or the attention devoted to the emotion. Examples are the use of relaxation techniques, drugs or alcohol to reduce anxiety. One important variant of emotion-oriented regulation is suppression, which consists of directing one’s attention away from the emotion and not acknowledging the emotion by refusing conscious awareness.

Appraisal-oriented regulation (or reappraisal) consists of changing the appraisals inducing the emotion. As described in Principle 5, developing self-confidence (i.e. appraisals of ability) and appraisals of task values can change students’ emotions.

Competence-oriented regulation involves developing one’s competencies, thus promoting positive emotions that result from successful action and reducing negative emotions. For example, students can enhance their enjoyment of learning and reduce their anxiety by increasing their competencies to learn and to succeed in academic examinations.

Situation-oriented regulation involves selecting or changing environments in ways that modify one’s emotions. For example, a student’s emotions can be positively influenced by selecting a school that fits his/her needs, or by selecting learning tasks that provide an appropriate level of challenge inducing enjoyment of learning and productive confusion rather than anxiety or boredom. Obviously, this type of regulation can be used by students only to the extent that they are given the autonomy to contribute to shaping tasks and learning environments.

Successful emotion regulation presupposes abilities to recognize one’s emotions and to select appropriate ways of managing them.

These abilities are part of emotional intelligence, which consists of abilities to recognize, make use of, and regulate one's own emotions and the emotions of other persons.

In the classroom

There are several ways in which emotion regulation can be used to help students. First, you can design your lessons accordingly, as addressed in Principles 7 to 9. Second, you can help students by informing them about strategies to regulate emotions and by practising emotional intelligence skills, such as abilities to recognize emotions. Social-emotional learning (SEL) programmes can be used to practice these skills. Third, methods to regulate emotions are used in the psychotherapy of emotions.

When teaching students about strategies to regulate emotions, you should know that all four types of strategies described above can be successful. However, reappraisal, competence development and situational change are often the most efficient. These strategies can be used before the emotion occurs, thus preventing negative feelings from developing. By contrast, emotion-oriented strategies are used when negative feelings have already been aroused, implying that it may be too late to prevent negative consequences from happening. Moreover, emotion-oriented techniques can have unfortunate side effects. For example, regulation of anxiety by medical drugs can momentarily alleviate excessive anxiety, but lead to the students becoming addicted to these drugs. When considering a specific strategy, always reflect upon the balance of benefits and disadvantages.

When a student suffers from excessive negative emotions, consulting a psychotherapist can help alleviate the problem. Specifically, psychotherapy for test anxiety is among the most successful therapies available today. Variants of test anxiety therapy target the symptoms of anxiety (e.g. relaxation training), lack of self-confidence causing anxiety (e.g. cognitive therapy), or underlying competence deficits (behavioural skills training; e.g. training to improve learning strategies). Combinations of these various treatments have been shown to be most effective for many students.

Suggested readings: Gross, 1998; Matthews, Zeidner, & Roberts, 2002; Thompson, Hughes, & Terrell, 2009.

7. Classroom instruction and teacher emotions

Provide high-quality lessons and make use of the positive emotions you experience as a teacher.

Research findings

The cognitive and motivational quality of classroom instruction is extremely important for students' emotions. Cognitive quality is defined by structure, clarity, task difficulty, and the match between task difficulty and students' competencies. Well-structured, clear instruction and use of moderately challenging tasks promote students' understanding. As a result, students experience an increase of self-confidence and enjoyment, and a reduction of boredom and anxiety. Moreover, moderately challenging cognitive problems can trigger cognitive conflict that facilitates surprise, curiosity and productive confusion promoting learning.

The motivational quality of instruction influences the perceived value of learning, thereby promoting enjoyment and reducing boredom. Motivational quality involves meaningful tasks that catch and hold students' interest (see Principle 5), giving autonomy to students to self-regulate their learning, introducing social structures of learning that satisfy needs for social relatedness, and the enthusiasm displayed by teachers demonstrating to students that academic engagement is enjoyable.

In the classroom

You can use several methods to improve the quality of your lessons. Five important groups of strategies are the following.

Cognitive quality. Provide instruction and tasks that have high cognitive quality. This helps students to understand the learning material, to build up competencies, and to develop the self-confidence needed to enjoy learning and reduce negative emotions. High cognitive quality can be obtained by ensuring that learning materials and explanations are well-structured, organized and clear, and by providing an appropriate fit between task demands and students' current level of competence. In addition, provide students with cognitive problems that involve a moderate amount of cognitive conflict likely to trigger surprise, curiosity and productive confusion.

However, make sure that confusion is resolved before students become frustrated, bored or anxious when they are unable to solve the problem.

Task contents. Use contents that are meaningful to students, which helps them to develop interest and intrinsic task values. You can make tasks more meaningful by providing contents that are related to students' current interests within and out of school, including their leisure-time activities, and by providing contents that are related to students' future personal and career goals. Alternatively, if the relationship between tasks and students' goals is not sufficiently clear from the contents, explain them to the students (see Principle 5).

Autonomy for self-regulation. Provide students with the autonomy to self-regulate learning in order to increase their enjoyment. Autonomy can be given to individual students or to groups of students, and can include defining goals for learning, selecting tasks and strategies used for learning, and monitoring and evaluating one's progress. However, autonomy should be matched to students' competencies for self-regulation. If students are not able to select appropriate strategies, autonomy can induce anxiety and boredom rather than enjoyment.

Social structures. Create social structures of learning that help students satisfy their needs for social interaction, which can promote their interest and the perceived value of learning. Examples are partner work and group work. If student groups lack the competence to organize their work effectively, you can assist them in developing these skills by scaffolding their learning.

Teacher emotions. Emotions are contagious and they can be passed on so that partners feel the same emotion. Therefore, the emotions that the teacher experiences and displays in the classroom can have profound effects on the emotions experienced by students. This is true both for positive emotions, such as enjoyment, excitement and pride during teaching, and for negative emotions such as anger, anxiety or frustration. Positive teacher emotions can promote students' enjoyment of learning within the classroom and can have long-lasting effects on the value of learning perceived by students. Therefore, teachers should take care to show the positive emotions they feel about teaching and the subject matter, and make sure that they share positive emotions and enthusiasm with their students.

Suggested readings: Frenzel et al., 2009; Hulleman & Harackiewicz, 2009; Schutz & Zembylas, 2009.

8. Goal structures and achievement standards

Use mastery goals and mastery standards for evaluating achievement.

Research findings

Different achievement goals contribute to students' emotions. Two groups of achievement goals are mastery goals and performance goals. *Mastery goals* relate to mastering the learning material and to improving one's competence. *Performance goals* relate to outperforming others or avoiding doing worse than others. *Co-operative goals* relate to group achievement based on co-operation between students. By focusing students' attention on the learning activity, mastery goals promote their enjoyment of learning and reduce boredom. By contrast, performance goals promote emotions related to success and failure, such as pride, anxiety, shame and hopelessness. Co-operative goals are likely to facilitate social emotions, such as collective pride in the group's accomplishments, sympathy towards other students, or anger at students who fail to show commitment to the group.

Classroom goal structures involve the goals that are conveyed by teachers and can be shared by students. When these goals are adopted by students, they influence students' emotions as described above. Due to their influence on emotions, these goal structures can have a strong impact on students' learning.

Similarly, the standards used to define achievement also influence students' emotions. *Mastery standards* imply measuring students' achievement in terms of the mastery of learning materials and improvement over time. More specifically, two types of mastery standards can be distinguished. *Criterion-referenced* standards measure achievement in terms of criteria of task mastery, whereas *individual standards* measure achievement in terms of the difference between present and past performance. *Normative standards* are similar to performance goals; they measure achievement in terms of an individual student's performance relative to other students' performances. *Group-based standards* measure the achievement of student groups.

Achievement goals and achievement standards convey expectations about the type of achievement expected from students. In addition, expectations from teachers and parents about the level of

achievement students should attain have a strong impact on their emotions. Excessively high achievement expectations contribute to students' test anxiety.

In the classroom

In order to enable all students to experience success, teachers should prefer mastery goal structures and mastery standards over performance goal structures and normative standards. With mastery standards, it is generally possible for every student to attain success. Mastery standards imply that the achievement of an individual student is evaluated independently from the achievement of the other students. Therefore, if every student attains mastery, you can inform all students that they have been successful. Use of mastery standards makes it possible for each student to be judged according to task mastery and improvement over time, which lays the foundations for developing self-confidence and positive emotions among the students.

By contrast, when using normative standards, teachers have to tell some students that they have failed due to performing worse than others, even if all students have actually shown mastery of the learning material. For example, with normative grading, good grades for some students come at the cost of poor grades for other students. Therefore, performance goals and normative standards can induce a competitive climate in the classroom – with these standards students must compete for success, and some students will fail by definition of the standard. Competition implies that some students can experience positive emotions, such as pride of success, whereas others experience failure and reduced self-confidence leading to anxiety, shame and hopelessness.

In many schools around the world, normative grading is expected from teachers. Even under such circumstances, however, it is possible to use mastery standards to provide added feedback on learning gains. Furthermore, group-based standards can be used to provide feedback on group work and individual students' contribution to group accomplishments.

Regarding the level of achievement teachers want students to attain, provide clear expectations that challenge students. Clarity and challenge can motivate students to invest effort. However, make sure that these expectations, even if challenging, are within students' reach and do not exceed their capabilities.

Suggested readings: Johnson & Johnson, 1974; Linnenbrink & Pintrich, 2002; Pekrun, Elliot & Maier, 2009.

9. Test-taking and feedback

Use well-structured tests, provide informational feedback, and avoid high-stakes testing.

Research findings

The organization of tests and assessments, the feedback provided after testing, and the consequences of individual achievement influence students' emotions. If the organization, demands and consequences of assessments are not clear to students, test anxiety is increased due to uncertainty about the possibility of failure and its outcomes. In addition, tests that involve high demands on attention can impair performance in students who are anxious about tests, because part of their attention is already occupied with worrying about failure. Anxiety can be further increased during such tests. For example, this may be true when creative essay writing has to be carried out in a limited period of time.

Feedback about achievement on academic tests is one of the most powerful factors in the development of achievement emotions. Repeated feedback about success can strengthen students' self-confidence over time and increase their positive achievement emotions, such as hope for success and pride. By contrast, repeated feedback about failure undermines self-confidence and increases negative achievement emotions, such as anxiety of failure, shame and hopelessness. This is especially true if feedback about failure is coupled with the message that failure is due to lack of ability.

The consequences of testing shape the value of achievement, thereby also influencing students' feelings about achievement. Whenever educational and occupational career opportunities are made dependent on individual achievement, the perceived importance of success and failure is increased. Combined with the likelihood of obtaining positive outcomes, increased importance can strengthen positive achievement emotions, such as hope for success. Combined with the prospect of failing to achieve one's educational potential or of becoming unemployed after graduating from school, students can experience increased anxiety and hopelessness.

In the classroom

To reduce uncertainty, teachers should provide clear information about the timing, demands and consequences of testing. Do not use surprise tests that have not been announced to students, especially if

this testing has important outcomes. To limit demands upon students' attention which puts test-anxious students at a disadvantage, you can use formats that reduce load, such as multiple-choice items. However, using such formats may contradict the aims of assessment, making it necessary to find a balance between fair testing and the goal of assessing competencies that demand full attention.

In addition, anxiety can be reduced, and confidence increased, by measures suited to increase students' expectations of success. Two examples are providing a choice between test items and providing second chances, such as opportunities for repeating examinations voluntarily.

Regarding feedback about achievement, you can strengthen students' self-confidence and positive emotions by using the following four guidelines.

1. Use mastery standards and avoid normative standards for evaluating achievement whenever possible (see Principle 8).
2. Use repeated feedback about success rather than failure by emphasizing improvement of performance, even if improvement is small, which can generally be done when using mastery standards.
3. There will be times when it cannot be avoided, or may even be necessary, that students have failed to learn some materials. In these cases, make clear to students that errors should not be regarded as information about lack of ability but as opportunities to learn.
4. Beyond evaluative feedback about success and failure, provide informational feedback about how students can improve their competencies and attain mastery. Detailed informational feedback, coupled with positive expectancies that mastery is possible, will strengthen students' confidence in their abilities, as well as support all the positive affective outcomes resulting from such confidence.

Finally, consider the consequences of assessment. High-stakes testing is defined as testing that entails serious consequences, such as decisions about students' career opportunities. High-stakes testing can increase positive achievement emotions in successful students but, for students who fail, it increases frustration and shame about failure, as well as anxiety and hopelessness related to the future. Therefore, avoid high-stakes testing whenever possible. Rather, create a culture of using assessments to gain information about how to develop mastery.

Suggested readings: Zeidner, 1998.

10. Family, peers and school reform

Involve parents, take care of the peer climate in the classroom and contribute to school reform.

Research findings

The classroom is not an isolated island. Students are influenced by their family and peers, and the classroom is influenced by school organization and the society at large. Therefore, factors from outside the classroom need to be considered to promote students' affective well-being.

Parents are the main contributors to students' development of emotions during the pre-school years and continue to be influential over the following school years. Pride of success and shame of failure are shaped in the family from an early age. Parents contribute to test anxiety when they hold excessively high achievement expectations that cannot be met by their child, and when they punish the child for failure. For most students, the parents are more important than teachers or peers for developing an identity in terms of individual core values, including the value of achievement.

Peers influence students' emotions in the classroom as well. Competition between peers for positive achievement evaluations increases students' test anxiety. Peers also influence the social emotions experienced in the classroom. Friendship networks in the classroom help students to develop positive social emotions, whereas aggressive behaviour, bullying and victimization among students contribute to depression and social anxiety in the victims.

Finally, the organization of schools provides the infrastructure and boundary conditions that facilitate or impede the implementation of emotionally sound educational practices in the classroom. For example, school systems in some countries include between-schools tracking that is based on student performance and assigns students to different tracks after elementary school. In such a system, it is necessary to use high-stakes testing at an early age in order to identify the performance information needed for decisions about assignments, which inevitably contributes to the early development of test anxiety.

Professional action—beyond the classroom

In order to understand students' emotions, it is helpful to acquire knowledge about their situation at home. Any attempt to help

students develop positive and reduce negative emotions may be more successful when supported by parents, but can fail when it meets with opposition from the family. Therefore, involving the parents may be most important to support students' positive affective development. Specifically, you can inform parents about their child's emotional situation at school, and you can provide parents with information about how they can support their child's emotional development. In cases of severe emotional problems that cannot be regulated within the classroom, it may be necessary to contact both the parents and an expert.

The peer climate in the classroom also needs to be taken into account. You can influence peer interaction and students' social emotions by organizing learning in terms of collaborative student work. You can promote mastery-oriented and co-operative goal structures among classmates by defining achievement goals and providing feedback based on mastery and co-operative standards. Furthermore, you can also take action to reduce anti-social peer behaviour. Specifically, research has shown that teachers need to intervene in order to reduce bullying and victimization in the classroom. Paradoxically, attempts to increase the social competencies of individual bullies and victims have proven to be insufficient and can even further aggravate the problem. In contrast, whole-school anti-bullying approaches in which teachers play an active role have proven to be successful.

Finally, being aware of the impact of school organization, school leadership and the education system can help you to understand opportunities and limitations resulting in classroom practices that benefit students' learning and affective development. Furthermore, it should be noted that education systems around the world are undergoing rapid change today. Whatever your role in the school context, you can contribute to productive change by making your voice heard and helping to organize schools in emotionally sound ways.

Suggested readings: Farrington & Tofi, 2009; Linnenbrink-Garcia, Rogat, & Koskey, 2011; Meyer & Turner, 2002.

Conclusion

Students experience a great variety of emotions that can have profound effects on their learning, personality development and health. The effects of these emotions can be complex. Positive emotions do not always benefit learning, and unpleasant emotions do not always impede learning. However, for the vast majority of students and academic learning tasks, enjoyment of learning is beneficial, whereas anxiety, shame, hopelessness and boredom are detrimental. Moreover, emotions are core elements of students' identity and well-being, implying that emotions are also important in and of themselves, beyond their functions for academic learning. For all these reasons, educators should attend to students' emotions.

There are several ways to help students increase positive emotions and decrease negative emotions. Most importantly, educators can help students develop the self-confidence, interest and intrinsic value of education that promotes excitement about learning and reduces negative emotions. This can be done by providing high-quality instruction, using one's positive emotions as a teacher, creating mastery goal structures in the classroom, employing mastery standards to inform students about progress at learning, avoiding high-stakes testing, involving parents, and caring for the peer climate in the classroom. Moreover, teachers can contribute to attaining emotion-related educational goals by helping to organize schools and education systems in emotionally sound ways.

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Notes

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