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Catalytic teaching: A teaching equation transfers to enhanced student learning

Claire Rogerson

University of Wollongong, clr976@uowmail.edu.au

Gerard Chomicz

University of Wollongong, gc477@uowmail.edu.au

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Abstract

This paper proposes that the teaching equation – where students, their levels of engagement and motivation create lifelong learners – is achieved with catalytic teaching approaches. Positive teaching practices are integral to the effective running of everyday classrooms, with teacher–student relationships important to the overall emotional and cognitive development of students. Three practical approaches are proposed, to implement aspects of the teaching equation for enhanced student learning. Using catalytic teaching ensures all students have access to positive teaching practices, leading to better student emotional and learning outcomes.

Keywords

positivity, role models, education, interactions, engagement, motivation, catalytic teaching



Catalytic teaching: A teaching equation transfers to enhanced student learning

Claire Rogerson

Bachelor of Primary Education (Honours), School of Education, University of Wollongong, Australia

Gerard Chomicz

Bachelor of Primary Education (fourth year), School of Education, University of Wollongong, Australia

This paper proposes that the teaching equation – where students, their levels of engagement and motivation create lifelong learners – is achieved with catalytic teaching approaches. Positive teaching practices are integral to the effective running of everyday classrooms, with teacher–student relationships important to the overall emotional and cognitive development of students. Three practical approaches are proposed, to implement aspects of the teaching equation for enhanced student learning. Using catalytic teaching ensures all students have access to positive teaching practices, leading to better student emotional and learning outcomes.

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Introduction

The relationship between teachers and their students has been extensively discussed in reference to the benefits of education each individual receives. However, the prevalence of positivity, in particular how students perceive their teachers in a positive role-model position, can be viewed from a variety of angles. For example, a teacher's personality, in addition to his or her method of instruction and levels of understanding, influence a student's outlook on particular subjects or on education in general (Domino, 2009). As such, teachers are highly influential in shaping the potential of a student (Sinagatullin, 2009). This article proposes that relationships and

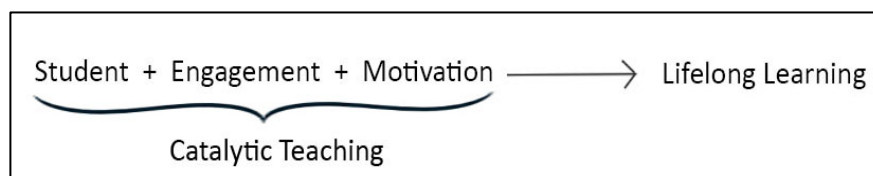


Figure 1: The teaching equation

interactions taking place within a classroom are integral to student development and can be represented within a teaching equation (TE) (see Fig. 1). The model likens the



educator to a catalyst who promotes and speeds up the rate of learning within a classroom. Furthermore, three practical approaches are suggested that support teachers to implement the TE within their classrooms. These approaches align with the engagement, motivation and life-long learning elements of the teaching equation, to ensure that positive teaching practices are being executed at every stage.

Catalytic teaching

Catalytic teaching occurs when teachers cater for the individual needs of their students and adapting their approaches accordingly (Horsley, 2012). Some characteristics identified by students of influential and significant teachers include a passion for teaching, strong knowledge of content, high yet realistic expectations and a conveyance of the belief that every student can achieve and will be supported to do so (Horsley, 2012). However, these characteristics were identified in relation to teachers being viewed as catalysts, defined by Gagné's Differentiated Model of Giftedness and Talent (DMGT) (Gagné, 2004, 2010). This model identifies the catalyst as providing a stimulating and motivating force to promote a transformation of raw ability into talent (Horsley, 2012). According to Gagné's DMGT, teachers act as classroom catalysts, in both environment and interpersonal relations (Gagné, 2004, 2010). However, this model is limited and based on gifted and talented education only. The TE proposes this concept can be taken further into generalist and special education, areas not given consideration to within the model before, to ensure access to these teaching practices to improve the learning outcomes of all students.

The teaching equation

In a regular classroom, there is likely to be a mix of students, some motivated and engaged in content and learning whilst others tune out and do not make any effort to participate in the lesson. The job to engage these students falls to the teacher and, unfortunately, many deem it too hard and merely concentrate their energy on the students who are interested in learning (Cohen et al., 2010; Conroy et al., 2009). Or, even worse, a teacher can devote too much time in engaging students who are misbehaving or off task and the ones; who were motivated to begin with switch off, in an attempt to gain the teachers' attention (Conroy et al., 2009).

As such, the TE (see Fig. 1) has been developed to demonstrate the influence that teachers have on their students. The TE likens the teacher to a catalyst, evident in many chemical reactions. These catalysts change the rate of a reaction without being consumed, allowing them to be recycled for use in further and future reactions (Carswell, Newman & Mihkelson, 1988). Therefore, the teacher acts as a short-cut for the reaction to take place, using their own expertise and skills to enable the learning reaction to take place without students having to expend as much energy as would be needed if they were to undertake similar learning individually (Yusuf, Kamarudin & Yaakob, 2012). For the reaction to take place, however, appropriate reactants are required in order for the correct product to be produced; in this case a lifelong learner. In addition, the environmental conditions such as classroom atmosphere and setting need to be suitable, so the reactants are at their most powerful when entering into the reaction (Sinagatullin, 2009).



Reacting components of the teaching equation

The first half of the TE contains the reactants of this process: students, motivation and engagement. Without any one of these elements, the full reaction would be unable to take place.

Students, although present in all classroom learning environments, are diverse and dynamic – as such, teachers must adapt their approaches in order to differentiate learning (Cohen et al., 2010; MacLeod & Napoles, 2012; Sinagatullin, 2009). To achieve this, teachers must not only consider their own philosophy of education but the learning environment as well (Sinagatullin, 2009). Through the creation of a positive and stimulating setting for students, teachers are able to support the creation of motivation and engagement within their classroom (Sinagatullin, 2009).

Gagné's model also proposes the importance of motivation in education, fitting into the environmental catalyst section of his diagram (Gagné, 2004). This again emphasises the important role of motivation and engagement within the equation acting as integral elements rather than supportive factors (Gagné, 2004).

Although engagement and motivation are usually synonymous in education, both are needed individually in order for the reaction to take place fully and to an effective extent (Elliott et al., 2006). If either is not involved then the desired end product of lifelong learning will not and cannot result. Therefore, engagement and motivation have been separated and defined to articulate the specific requirements of each reactant within the equation.

- **Engagement** can be considered as the interest and associated level of involvement in a task (Kelly, 2009; Martin & Furr, 2010). Teachers must adapt their teaching strategies to prompt student interest and make their students more likely to participate (Martin & Furr, 2010). This increases the level of engagement within their students toward the content being taught (Kelly, 2009). Engagement can be seen in the beginning stages of a task, with students displaying an interest and overall curiosity to the task at hand, which paves the way for motivation to continue in the completion of the task (Martin & Furr, 2010).
- **Motivation** can be seen as the drive to complete a task, activity or goal (Sinagatullin, 2009; Skinner & Belmont, 1993). It is the teacher's job to discover the individual motivation factors of their students and adapt their approaches accordingly in order to make sure that students *want* to complete the task (Cohen et al., 2010; Dent & Holton, 2009; Sinagatullin, 2009; Skinner & Belmont, 1993). In the case of the TE, teachers are striving to support students to become intrinsically motivated, inherently driven to complete tasks, rather than supporting learning with extrinsic factors such as stickers, sweets or other rewards (Dent & Holton, 2009). This, in turn, benefits students as they begin to view tasks in terms of their educational value rather than the perceived tangible benefits that can be associated (Dent & Holton, 2009; Self, 2009; Sinagatullin, 2009). Therefore, motivation is end-goal orientated, with teachers wanting students to feel engaged in a task to the point that they are



motivated to complete it, valuing the goals and educational benefits that it will bring (Dent & Holton, 2009; Martin & Furr, 2010; Self, 2009).

The teacher catalyst

Within the TE, teachers are likened to a catalyst, lowering the amount of energy required for the reaction to take place by simplifying content and communication for students to learn and develop within the classroom (Carswell, Newman & Mikhelson, 1988). In this way, the rate of the reaction is changed, without the teacher's educational capacity being consumed, allowing the one teacher to be utilised in many different equations concurrently (Carswell, Newman & Mikhelson, 1988). In this reaction, teachers act as heterogeneous catalysts, who are at a different stage in education than their students and thereby provide a pathway for a simpler and more-efficient learning reaction to take place (Yusuf, Kamarudin & Yaakob, 2012). Teachers who operate in this fashion are said to facilitate higher levels of student success and are more-effective teachers (Horsley, 2012). Students have identified characteristics of such teachers as being warm, sympathetic and trusting yet set high, realistic expectations for the classroom, as they not only feel respected and safe but like that they are being challenged and extended in everything they undertake (Horsley, 2012; Sinagatullin, 2009; Yee, 1969).

Products of the teaching equation

The combination of students, engagement and motivation in the presence of a catalytic teacher create the desired outcome of any educational experience – a lifelong learner. In this case, teachers not only want students to learn, but nurture and encourage curiosity in education to ensure that this passion for knowledge continues beyond their classroom walls (Sinagatullin, 2009). Through this, the product associated with the completion of the TE is a lifelong learner.

The most desirable outcome for the TE is for it to be implemented in every teaching classroom, allowing students a continuity of education from one year to the next. If teachers can continue on from where another teacher left off the year before, they simply teach new content and extend the students' understanding further. However, this may not always be possible, with some teachers finding it difficult or being resistant to change within the comfort of their philosophies and approaches. For this reason, these teachers may not adopt the catalytic teaching ideas and, therefore, the students of previous teachers may come into their new classrooms each year and be taught in a dramatically different way.

However, teachers must cater to the shifting and diverse needs of their students and, if some teachers are not using the catalytic approach, they may need to adapt their teaching styles to cater for the needs of students who have already been taught that way (Sinagatullin, 2009). This allows teachers to provide students with the level and quality of education that they require while catering for the specific learning styles and needs of that student (Cohen et al., 2010; Sinagatullin, 2009).

Practical approaches to support catalytic teaching

To relate the TE to classroom teaching, three separate approaches have been devised to support teachers in implementing the equation. Approaches are associated with



three clear stages of classroom development, which also align with three components of the TE; establishing (encouragement), designing (motivation) and implementing (catalytic teaching). Firstly, the *5 Rs for Positivity in the Classroom* are utilised in the establishment phase of classroom development, which aims to support teachers in their set up of an effective learning environment for students (Sinagatullin, 2009). *RIDE Positivity* can then be applied while designing units and lessons that will encourage the TE to be integrated into everyday classroom practice (Cohen et al., 2010). The final approach of *SETS* is then used in the implementation of the TE, and in conjunction with the prior planning achieved through other approaches to ensure that all students become lifelong learners within the classroom (Sinagatullin, 2009).

Although these approaches could be used in isolation within the classroom context, they have been designed so that they operate most efficiently when used in collaboration with one another. This is because the planning and pedagogy associated with one builds on what is needed for the following approach.

5 Rs for positivity in the classroom

The 5 Rs is an approach that supports teachers in establishing a classroom where effective learning can take place, and lifelong learners can be created. Careful planning of five elements in relation to classroom practice, support teachers to create an engaging and stimulating learning environment in which the TE can become evident (Pickett & Fraser, 2010; Sinagatullin, 2009). Engagement is the level of interest, curiosity and involvement that a student feels toward a certain task (Kelly, 2009; Martin & Furr, 2010). If teachers establish their learning environment with the following five elements in mind, then students will be more engaged in content and, therefore, achievement will blossom (Pickett & Fraser, 2010).

Role models

Teachers must consider their status in the classroom, as their students will take behaviour cues from the actions of the teacher (DeCosta, Clifton & Roen, 2010; Shein & Chiou, 2011; Sinagatullin, 2009; Yee, 1969). As such, teachers must see themselves as role models and plan out the expectations of behaviour and attitudes that will be present in their classrooms (Domino, 2009; Sinagatullin, 2009; Yee, 1969). By clearly communicating and demonstrating appropriate and desirable behaviours to students whilst providing challenging and engaging learning opportunities, the likelihood that students will continue with an interest in education increases (Hallinan, 2008; Sinagatullin, 2009).

Relationships

By creating positive teacher–student and peer–peer relationships within the classroom, teachers can increase the emotional well-being and general happiness of their students (Klem & MacLeod & Napoles, 2012; Pickett & Fraser, 2010; Seligman et al., 2009). This will not only improve academic achievement in the classroom, but support students in achieving a sense of engagement with content within the classroom through a general enjoyment of the atmosphere and environment (DeCosta, Clifton & Roen, 2010; Klem & Connell 2009; Seligman et al., 2009). In turn, this supports teachers in the creation of the reactants to the TE, to ensure that lifelong learners will be created in their classroom. However, teachers must plan how these



relationships will be encouraged in their classroom, possibly through ‘buddy’ programs, seating charts or teacher–student learning conferences to ensure that *every* student is given opportunities to connect and relate to their peers and the teacher (Sinagatullin, 2009).

Reactions

The way that teachers respond and react to students is important in determining the way that they will reciprocate that communication (Sinagatullin, 2009). Students will mimic any behaviour, desirable or otherwise, that they see a perceived role model undertaking (Domino, 2009; Hallinan, 2008; Shein & Chiou, 2011; Sinagatullin, 2009; Yee, 1969). If teachers do not effectively incorporate feedback in their classroom or show a disinterest in a student’s achievement, that student will show the same lack of interest back to the teacher (Conroy et al., 2009; MacLeod & Napoles, 2012; Sinagatullin, 2009; Yee, 1969). This, in turn, decreases the engagement within a task and diminishes the *outcome* of the TE. Therefore, teachers must be aware of how they approach situations and the ways in which they respond in order to establish proper expectations of behaviour for their students (Sinagatullin, 2009).

Reinforcement

Teachers should examine each student’s personal learning history to understand how they learn and how best to support each student within their classroom (Cohen et al., 2010; Sinagatullin, 2009). This should be done at the beginning of a year, in addition to discussions with previous teachers, to ascertain which students may need more support or extension than others (Cohen et al., 2010; Gagné, 2007; Sinagatullin, 2009). Within the ‘reinforcement’ element, teachers should also plan *how* they want their students to learn. Whether this be through an integration of technology or a selection of metacognitive strategies, teachers must consider the way that they are going to present content to their students to ensure that all students remain engaged and interested in learning (Cohen et al., 2010; Gagné, 2007). It is also important to consider how content can be connected and linked to other topic and curriculum areas, to ensure that a student’s background knowledge is being developed to allow for a deeper learning to take place (Cohen et al., 2010).

Refresh

It is integral that teachers consistently review their teaching philosophies and styles to cater for the particular needs of their students at any one time (Cohen et al., 2010; Sinagatullin, 2009). This also means that teachers should use innovative methods to teach content, to ensure that all students are engaged and on task (Cohen et al., 2010; Schultz & Coleman-King 2012). This could include asking students to take photographs of patterns in nature or designing a rap for a tricky mathematics concept. In this way, students are kept engaged in content with it being altered to meet the changing needs and interests of the students it targets, while allowing for teachers to renew their approaches in accordance to what will work best for the students in their care (Cohen et al., 2010).



RIDE positivity

RIDE positivity (see Fig. 2) has been developed to support teachers in the implementation of catalytic teaching principles in their classrooms. It is concerned with teachers examining the ‘how’ of teaching and follows on from the 5 Rs, which aim to plan out teaching strategies to ensure that effective learning is taking place. The RIDE elements seek to create a scaffold of what teachers should consider when implementing the TE into their everyday classroom practice. It is also concerned with developing the motivation that students need to continue to learn, long after they have left the classroom. In this case, motivation is defined as the drive to complete an activity or achieve goals for their own sake, and it is the job of the teacher to ensure that the motivating factors used are those that will promote intrinsic, internal motivation (Sinagatullin, 2009; Skinner & Belmont, 1993). Although there is overlap in some of the components of both the 5 Rs and RIDE, the approaches are very different, as teachers must firstly plan then consider *how* they will implement the plan, which is where RIDE comes into practice.

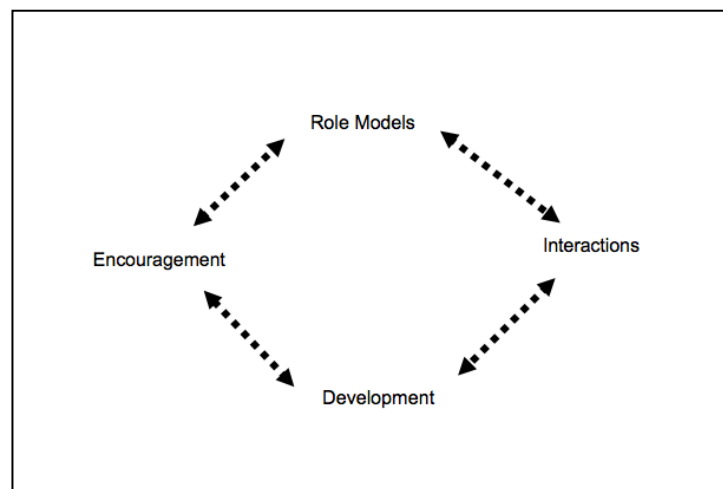


Figure 2: RIDE Positivity

Role models

Teachers must carefully consider what behavioural and social expectations will be in place in their classrooms to ensure that they role model this behaviour in order for their students adopt both in the classroom and in later life (Hallinan, 2008; Shein & Chiou, 2011; Sinagatullin, 2009). It is through the demonstration of following rules and expectations by the teacher that students can understand what is required of them (Sinagatullin, 2009). As the teacher acts a figure of authority and responsibility both inside and outside the classroom, students are more likely to imitate their behaviours when demonstrated the accepted norms by their teacher (Shein & Chiou, 2011; Sinagatullin, 2009).



Interactions

A large part of effective classroom activity incorporates group work and promotes positive and intellectually stimulating conversation between peers (Cohen et al., 2010). As a result, teachers should implement activities that promote healthy and stimulating interactions between students and themselves (MacLeod & Napoles, 2012). This is because teachers must understand that they are at the centre of all classroom activity (Sinagatullin, 2009). Without planning and implementing effective educational experiences that encourage educational relationships, the teacher should not expect high levels of engagement and motivation within their classroom environment (Hallinan, 2008).

Development

The level of intellectual engagement and progress must also be examined before, during and after activities to ensure that students are receiving the most out of the educational experiences offered to them (Cohen et al., 2010; Sinagatullin, 2009). Additionally, teachers must consider how their planned activities are going to benefit students and progress them in their education (Sinagatullin, 2009). This does not have to be lesson specific but could take place over a period of time in which students study one topic or unit of work.

Encouragement

Teachers must also consider how they will maintain interest in lessons to ensure that the levels of associated motivation are high (Sinagatullin, 2009). By providing students with opportunities to be challenged, extended and responsible for their own learning, teachers give students a chance to be intrinsically motivated, without the incentive of rewards to prompt them to complete a task (Cohen et al., 2010; Marshall, 2005; Sinagatullin, 2009). This could be accomplished by providing students with reasonable and appropriate choices that empower and hand back responsibility, while allowing students to reflect on their work, giving them time to question and consider the impact of their behaviour and attitudes (Marshall, 2005; Sinagatullin, 2009).

SETS

SETS has been developed in order to provide teachers with a simple way to incorporate positive communication strategies within the classroom. The SETS components, when combined, provide students with a more satisfying and rewarding learning experience (MacLeod & Napoles, 2012). It is also an implementation mechanism for catalytic teaching, requiring teachers to be proactive and directly involved in the learning and development of their students (Cohen et al., 2010). As such, students can feel more involved in classroom activities, take more pride in their achievements and be motivated to set future goals within the classroom (Conroy et al., 2009; Gagné, 2010; Seligman et al., 2009). The positive interactions taking place between teacher and student enable SETS to be applicable in a variety of situations and for a range of students. This includes students with different ethnic backgrounds, English-speaking abilities and special needs requirements (Cohen et al., 2010; Sinagatullin, 2009). It is also important to note that teachers can encourage students to use the same set of positive communication strategies when interacting with one



another to further promote a positive learning atmosphere (MacLeod & Napoles, 2012).

Smile

The visual stimulus of a smile can make all the difference to a disengaged or unmotivated student, as it is a simple positive gesture that builds rapport between student and teacher (MacLeod & Napoles, 2012; Roberts 2010). It also provides non-verbal feedback to reinforce the positive behaviour or attitude that a student may be exhibiting at the time, and encourage this to recur (MacLeod & Napoles, 2012; Sinagatullin, 2009). The teacher should also encourage students to smile at one another to indicate an interest and receptiveness toward the other person.

Eye contact

Teachers must provide eye contact with their students to indicate that they are focused and giving their undivided attention to the task or question at hand (MacLeod & Napoles, 2012). This includes giving positive feedback when students are asked or are responding to a question, to ensure that the student knows you are interested in what they have to say (MacLeod & Napoles, 2012).

Tone of voice

Students should never have to question if a teacher is being sincere, and this can be identified through the tone of voice used. Using a bright and musical tone, with as much variety as possible indicates an interest and positivity to what is happening while monotone praise only demonstrates a lack of enthusiasm (Cohen et al., 2010; MacLeod & Napoles, 2012). Similarly, teachers must match their tone to the situation at hand, to ensure students understand the difference between a serious situation and being positively praised (Cohen et al., 2012). Students could also be encouraged to adopt the same approach, making sure their tone of voice matches what they are trying to convey.

Say more

Potentially the most important component of SETS, is the idea that teachers need to say more to a student than the tokenistic ‘good work’ or ‘well done’ when giving feedback (Sinagatullin, 2009). These are simple phrases that are often overused in the classroom and do not place emphasis on what the student has done to deserve praise (MacLeod & Napoles, 2012). Although the classroom can be a very busy and sometimes hectic environment, the extra few seconds it takes to properly praise a child for their efforts or great work will make a significant difference in the future (MacLeod & Napoles, 2012; Shute, 2008). This is when words do matter and phrases like “that’s fantastic work, I really like how you...” should be used and encouraged, as this is more specific, personalised and indicates exactly why you are praising the student.

Conclusion

A 21st century teacher needs to be able to effectively teach six key learning areas, manage behaviour, organise external and extra-curricular activities, all while running



their day-to-day classroom activities (Cohen et al., 2010; Pickett & Fraser, 2010; Sinagatullin, 2009). By adopting catalytic teaching approaches, teachers are able to make their jobs easier whilst enhancing student learning.

To truly create a positive classroom, it comes down to the teacher. Teachers must consider their role as well as their expectations in the classroom to guide their approaches towards the education of their students. It becomes the job of the teacher to ensure that each student has a positive feeling toward learning and it is by implementing the 5 Rs, RIDE positivity and SETS that this can be enhanced. These have all been developed in a way that both pre-service teachers and more-experienced teachers can integrate these teaching approaches to better match their established teaching philosophies and grounding theories, and provide the most positive class and learning environment possible. Founded in integral, key concepts of teaching such as encouragement and reinforcement, these teaching attributes are relevant to every classroom situation so that, regardless of student ability, English as a second language or special needs, all students can benefit from the positive teaching that eventuates.

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