



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

2016

The impact of teacher–student relationships on the development of talent: Connections with Gagné’s DMGT 2.0

Wade Dever

University of Wollongong, wd733@uowmail.edu.au

Follow this and additional works at: <http://ro.uow.edu.au/jseem>

Recommended Citation

Dever, Wade, The impact of teacher–student relationships on the development of talent: Connections with Gagné’s DMGT 2.0, *Journal of Student Engagement: Education Matters*, 6(1), 2016, 2-12.

Available at: <http://ro.uow.edu.au/jseem/vol6/iss1/2>

The impact of teacher–student relationships on the development of talent: Connections with Gagné’s DMGT 2.0

Abstract

Teacher–student relationships are a critical component in education, influencing development across emotional, behavioural, academic and social domains. While there is considerable research on teacher–student relationships in the everyday classroom, little has been identified on the impact of teacher–student relationships within the gifted and talented population. This review draws together research on teacher–student relationships and Gagné’s gifted and talented developmental theory. The paper firstly discusses teacher–student relationships in a broad sense and defines the gifted and talented developmental process in line with Gagné’s theory. The paper then combines the two bodies of research to explore and discuss the potential impacts that teacher–student relationships may have on the development of talent. In particular, the paper will discuss the effects that teacher–student relationships have on the identification processes needed to acknowledge those who are gifted and talented. Additionally, the paper will explore how motivation in regards to academic achievement can be fuelled by negative teacher–student relationships. A discussion will follow on how relationships formed with peers can affect those who are gifted and talented and how the teacher–student relationship can have a significant role in how peer relationships develop.

Keywords

relationships, catalysts, giftedness, talent; education, Gagné, teacher, student



The impact of teacher–student relationships on the development of talent: Connections with Gagné’s DMGT 2.0

Wade Dever

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

Teacher–student relationships are a critical component in education, influencing development across emotional, behavioural, academic and social domains. While there is considerable research on teacher–student relationships in the everyday classroom, little has been identified on the impact of teacher–student relationships within the gifted and talented population. This review draws together research on teacher–student relationships and Gagné’s gifted and talented developmental theory. The paper firstly discusses teacher–student relationships in a broad sense and defines the gifted and talented developmental process in line with Gagné’s theory. The paper then combines the two bodies of research to explore and discuss the potential impacts that teacher–student relationships may have on the development of talent. In particular, the paper will discuss the effects that teacher–student relationships have on the identification processes needed to acknowledge those who are gifted and talented. Additionally, the paper will explore how motivation in regards to academic achievement can be fuelled by negative teacher–student relationships. A discussion will follow on how relationships formed with peers can affect those who are gifted and talented and how the teacher–student relationship can have a significant role in how peer relationships develop.

Keywords: relationships; catalysts; giftedness; talent; education; Gagné; teacher; student

Introduction

The quality of a teacher–student relationship (TSR) is a powerful element situated within a learning environment and subsequently plays a significant role in a student’s development and school experience. TSRs have been found to influence a student’s school experience across academic, social, emotional and behavioural domains (den Brok et al., 2005; Matthews & Dai, 2014; McGrath & Bergen, 2015; Roorda et al., 2011; Zhang, 2007). When considering TSRs, the interactions that occur are informed by, and contribute to, the psychology of the teacher or student, including their attitudes, emotions, temperament and personality (McGrath & Bergen, 2015). Additionally, TSRs can be influenced by other aspects, such as gender, ethnicity, socioeconomic status or academic ability (McGrath & Bergen, 2015). Therefore, due to the influences associated with, and psychology of, both members involved in the interaction processes, relationships can be viewed as dyadic, where each participant influences the other (McGrath & Bergen, 2015; Yu & Zhu, 2011).



The perspective presented in this paper is that a positive TSR is considered to be one that enhances constructive learning behaviours and provides the support and warmth required for the student to deal with the demands of the school setting. Conversely, a negative TSR is characterised by teaching behaviours that lack academic and emotional support and, in turn, hinder the student's ability to deal with the demands of the school setting.

Teacher–student relationship theories

Three key theories largely inform the research found on TSRs discussed in this paper: ecological systems theory, attachment theory and determination theory. It is beyond the scope of this paper to discuss these theories in depth, but a brief overview of their connections will be discussed.

Ecological systems theory

Bronfenbrenner's ecological systems theory (Rosa & Tudge, 2013) comprises five contextual systems that influence a child's development.¹ The first level, the microsystem, represents the immediate context in which the child develops. The microsystem connects with TSRs as it includes significant people, such as teachers, as well as settings, such as the school and their influences on development (Howard & Walton, 2015). It is within this microsystem that dyadic relationships play an integral role in understanding developmental changes (Howard & Walton, 2015; McGrath & Bergen 2015).

Attachment theory

Attachment theory addresses the influences of significant adult–child relationships, such as teacher–student, in human development (Schwartz, 2015). 'Healthy' development occurs when a child's caregiver positively supports the emotional, physical and social needs required by the individual (McGrath & Bergen, 2015; Verenikina et al., 2013). The quality of the emotional bond between a teacher and student has significant implications in shaping development. Children develop internal representations of the relationship, which are, in turn, used to predict future behaviours and responses (McGrath & Bergen, 2015; Verenikina et al., 2013).

Self-determination theory

Self-determination theory when applied within the school setting discusses that motivation is dependent on three "innate, universal and psychological" (McGrath & Bergen, 2015, p. 2) needs: autonomy, competence and relatedness. In connection with TSRs, the self-determination theory concept of relatedness is significant. When students feel safe and have a positive relationship with their teacher it can act as a source of motivation, enhancing engagement and achievement (McGrath & Bergen, 2015).

¹ While Bronfenbrenner's bioecological theory superseded the ecological systems theory, with significant organisational changes, the contextual components described here remained the same. For a fuller discussion see Rosa and Tudge (2013).



The gifted and talented

The New South Wales Department of Education and Training (NSW DET) defines the unique population of gifted students around two key concepts: giftedness and talent. The two concepts within the policy have been based on Gagné's Differentiated Model of Giftedness and Talent (DMGT) (NSW DET, 2004). Giftedness can be defined as having the possession and use of potential that is untrained and expressed randomly (Gagné, 2004, 2012). It is when the level of the ability being expressed is above average that the term 'gifted' can be used. Additionally, a gifted student's ability is one that is 'distinctly' above the average in at least one of the ability domains, also known as aptitude domains (Gagné, 2004, 2011, 2012; NSW DET, 2004). The aptitude domains are; intellectual, creative, socio-affective and sensorimotor (Gagné, 2004, 2011, 2012). Alternatively, talent is a developmental construct that refers to "outstanding mastery of systematically developed abilities and knowledge" (Gagné, 2004, p. 120) within at least one field of human ability. Talented students are those whose ability is clearly above the average of their same-age peers (NSW DET, 2004). It is when a student demonstrates outstanding skill mastery that they can then be referred to as talented. Therefore, talent can be recognised as being placed among the top 10% of same-age peers who have been active in the same field (Gagné, 2004, 2011, 2012). It is important to note that one cannot be talented without first being gifted, but the reverse is not true (Gagné, 2004, 2011, 2012). Gifts to Gagné are like 'raw material' and it is when this raw material is refined, moulded and mastered into a specific divergent skill they become talents (Gagné, 2004, 2011). It is within the refinement of gifts into talents that the gifted and talented developmental process occurs (Gagné, 2004). In addition, for identification of giftedness and talent the five degrees of giftedness and talent are used: *mildly*, *moderately*, *highly*, *exceptionally* and *extremely* (Gagné, 2004). One of the goals of the NSW DET gifted and talented education policy is to establish a clear understanding of the requirements and processes involved in identifying gifts and developing them into talents.

The gifted and talented developmental process

According to Gagné, four processes contribute to the development of giftedness and talent. These four processes are: maturation, informal learning, formal non-institutionalised learning and formal institutionalised learning (Gagné, 2004). Maturation deals mainly with the impact that the genes have on the growth or transformation of biological structures or the physiological processes. Informal learning relates to the acquired knowledge and skills attained due to everyday, unstructured and informal learning experiences encountered in life (Gagné, 2004). For example, this can be the attainment of language, social skills and general knowledge that young children experience before they enter the formal learning environment, such as school. Non-institutionalised formal learning is in connection with self-taught learning of a particular skill, often through leisure activities (Gagné, 2004, 2012). Finally, formal institutionalised learning must lead to some sort of official recognition of gifts or talent throughout the learning process, such as that found within school. Formal institutionalised learning is regarded as the most common of the learning processes (Gagné, 2004, 2012).



Both non-institutionalised and institutionalised learning are termed ‘formal’, as the learner is deemed to have a conscious intention to develop a specific learning goal and has utilised a sequence of learning steps to reach that specific learning goal, often systematically (Gagné, 2004, 2012). It has been suggested that the biggest influences on giftedness are maturation and informal learning and that talent development is impacted highly within both formal non-institutionalised learning and formal institutionalised learning (Gagné, 2004, 2012).

Gagné developed the Differentiated Model of Giftedness and Talent 2.0 (DMGT 2.0) to understand and explain why some people have the capacity to achieve to exceptional levels and some do not (Gagné, 2004, 2012; Vialle & Rogers, 2009)². In particular, the DMGT 2.0 outlines the developmental process of transforming gifts into talents, while additionally highlighting components that may hinder or enhance that process, known as catalysts (Gagné, 2011, 2012). The components of the DMGT are: natural abilities (gifts), the developmental process, competencies (talents) and the two catalysts, intrapersonal and environmental (Gagné, 2004, 2011, 2012), all of which are influenced by chance. The essence of the DMGT 2.0 is that the components interact with each other in multiple and complex ways.

The developmental process outlined within the DMGT 2.0 contains three sub-components. The three sub-components are *activities*, *progress* and *investment* (Gagné, 2004, 2011, 2012). *Activities* refer to the access, content and format of specialised learning experiences that are available for a gifted student. The development of talent can be initiated when the student can gain access, through the identification process or through being selected to a program that is systematic and focuses on talent-development activities. Through these activities the student is provided with content that is relevant and suitable for their needs, whilst being delivered within a certain learning environment, the format. The learning environment or format that is most commonly found within schools is structured (Gagné, 2011, 2012).

Progress refers to stages, pace and turning points (Gagné, 2004, 2011, 2012). Stages in talent development can be determined from the progress the student encounters from initial access to their mastering performance. This progress can be broken into novice, advanced, proficient and expert (Gagné, 2004, 2012). Pace refers to the speed in which the student’s development toward a specific goal is progressing in comparison to the same-learning peers. Students may require specific learning to be delivered at different speeds at different times to gain a deep understanding (Gagné, 2011, 2012). The turning points outlined by Gagné refer to specific and crucial points within the developmental course of a student which impact on development, such as being acknowledged by a teacher, gaining a scholarship or significant personal hardships (Gagné, 2004, 2012).

Investment connects with the time, money and energy that are accessible throughout the developmental progression (Gagné, 2004, 2011, 2012). The amount of time that is invested, the financial support provided and the psychological energy expended throughout development gives rise to differences between students. The *investment* provided is a very important component in talent development, as it can increase or decrease over time, impacting opportunities available (Gagné, 2011).

² See Walton (2014) for a discussion of how Howard Gardner’s multiple intelligences theory can be mapped onto the DMGT 2.0.



In summary, students have the greatest chance to develop gifts into talents when: they have been identified as gifted; have access to a specific program of enriched activities; are provided with opportunities to learn at their own pace; and are matched to their developmental level. If the *activities, progress* or *investment* are hindered or blocked in some way the chances of development are dramatically reduced. The catalysts, discussed below, can impact on *activities, progress* and/or *investment*.

The catalysts

Gagné's DMGT 2.0 identifies two groups of catalysts that impact positively or negatively, by their presence or absence, on the complex developmental process of giftedness into talent: intrapersonal and environmental. Intrapersonal catalysts are comprised of two dimensions. The first dimension is the physical and mental traits that students may embody (Gagné, 2004, 2011, 2012). The physical traits can refer to disabilities, appearance or gender, for example. The mental traits are extensive, but behavioural styles and temperament fall under this umbrella. The second intrapersonal catalyst is the goal-management dimension (Gagné, 2004, 2012). This is divided into three categories: awareness, motivation and volition (Gagné, 2004, 2011, 2012). Having an awareness of the strength and limitations of a student, or the student's view of themselves, can be crucial in organising and implementing developmental activities. Motivation focuses on what motivates the individual, their level of motivation and how much effort one is prepared to invest toward the learning goal (Gubbels, Segars & Verhoeven, 2014). Lastly, volition is the process by which one decides and commits toward attaining the learning goal and the goal-attainment activities (Gagné, 2012). Although Gagné stresses that the development of talent is the 'choreography' between the causal components, he believes that if he was to place them in hierarchical order, intrapersonal catalysts sit near the top (Gagné, 2012).

The second catalyst identified in the DMGT is environmental, which is distinguished by three dimensions. The first dimension, milieu, incorporates the physical, social and cultural environmental influences on talent development (Gagné, 2004). The second dimension, individual, incorporates the direct influences of significant teachers, peers and family on the student's environment (Gagné, 2004, 2012). The third, and last, of the environmental catalysts is the provisions subcomponent. This recognises the impact that pedagogy and the developmental services or programs available have, such as enrichment, curriculum compacting or withdrawal classes.

TSRs can be positioned within both the interpersonal and environmental catalysts of the DMGT 2.0 and have an overall influence on the development of talent. Within the interpersonal catalyst the TSR can be viewed as having an influence on the goal attainment, motivation and behaviours associated with talent development (Gagné, 2004, 2012; McGrath & Bergen, 2015). Within the environmental catalyst, TSRs can be drawn in close connection with the influence of 'significant others' and, in turn, the interest students have towards the learning environment (Gagné, 2004, 2012). Therefore, it is pivotal that educators gain a deep understanding of why TSRs are particularly important and what the difference in the quality of the TSR can potentially equate to for the development of talent.



Teacher–student relationship impact on talent development

As mentioned earlier, TSRs can impact, both positively and negatively, a student's school life. When referring to giftedness and talent, the influence that catalysts have on success of the developmental process have been identified with both positive and negative results (Gagné, 2004, 2012). The closest connection that a TSR can have on impacting talent development is through the environmental catalyst, *individual* (Gagné, 2004). In particular, the concept of environment draws together the profound influence that significant others can have on a student's talent development (Gagné, 2004, 2012). The relationships formed between teachers and students with respect to the specific educational needs of the gifted and talented, whether they are supportive or conflicting, can be viewed as occurring most frequently within the environmental catalyst component (Gagné, 2004). When a positive TSR is experienced there is the potential for the promotion of students feeling connected with and interested by their school environment (Roorda et al., 2011). Additionally, students' progress with pro-social and adaptive behaviours is enhanced with a positive TSR (McGrath & Bergen, 2015; Rey et al., 2007). Research by McGrath and Bergen (2015) identified that when a relationship is formed in a positive manner students' social, behavioural and emotional engagement outcomes were greater than those who experienced negative relationships. Yet, negative TSRs can have a powerful impact on teacher and student expectations. In turn, students may experience reduced school engagement and behavioural issues (McGrath & Bergen, 2015).

The NSW DET (2004) gifted and talented policy places emphasis on the responsibility that a teacher has on initiating the identification process. Identification by teachers requires both a deep understanding and knowledge of students and the effective and inclusive means to identify a gift and talent within the student (Reid, 2011). A conflicting TSR has the potential to impact on the necessary processes required by teachers for giftedness identification. If a student or a class experiences reduced social, behavioural and emotional engagement formed with the teacher through a negative relationship there is the potential risk that a teacher may not commence the appropriate identification processes. Negative TSRs can minimise a student's self-efficacy (den Brok et al., 2005; Van Uden, Ritzen & Pieters, 2013). This could potentially reduce the student's confidence in the self-identifying processes that are recommended, as they may not refer to themselves in positive terms.

TSRs in the early years of primary education may subsequently predict a student's future feeling toward similar relationships and attitudes, throughout their entire schooling experience (McGrath & Bergen, 2015). This suggests that there is potential for the students to continue throughout schooling without being identified as gifted and running the risk of underachievement. In turn, this may seriously impact the provisions subcomponent of the environmental catalyst. If the identification process is significantly damaged as a result of a negative TSR, through things such as student demotivation and underachievement, then a school may not justify the need to provide necessary provisions to support talent development (den Brok et al., 2005; Gubbels, Segars & Verhoeven, 2014). If the provisions for the development of talent in a particular domain do not exist then the possibility of reaching an expert level in that domain is significantly hindered (Reutlinger & Till, 2011). Therefore, it can be suggested that, when predicting and supporting talent development, a positive TSR



has the potential to create a positive, supportive and structured environment that encourages talent development.

Peer relationships have been identified in the DMGT 2.0 as an important factor influencing the talent development process. Peer observations of TSRs can influence peer perceptions and, in turn, the quality of peer relationships (Davis & Lease, 2007; McGrath & Bergen, 2015). In particular, an individual's academic ability and social competency can be viewed and partially determined by the peers' observations based on the teacher's relationship with that individual (McGrath & Bergen, 2015). This is important as a student's interactions with peers can influence development in cognitive and social domains (Cornell, 2004). Students who have become unpopular with peers through a destructive relationship with their teacher have been identified as having reduced initiative, avoid leadership roles, dislike working independently and often refer to themselves in negative terms (Cornell, 2004). In addition to peer interaction influencing the development of cognitive and social domains of a student, peer nomination is a recommended and important step in the talent identification process of the NSW DET (2004). There is potential that if students suffer from poor peer acceptance due to a conflicting TSR, gifted students may run the risk of not being nominated. Although there are other factors at play, such as temperament, behaviour and socio emotional factors, TSR has been correlated with peer acceptance (Cornell, 2004; Gubbels, Segars & Verhoeven, 2014; McGrath & Bergen, 2015). Experiencing a positive TSR may be an important and integral factor for improving peer relationships and allow a greater chance of being recognised and nominated by their peers for gifted and talented programs. This is important, as when a student is nominated for and incorporated into a gifted and talented program there is a greater chance the student will improve their cognitive potential and socio-emotional characteristics (Gubbels, Segars & Verhoeven, 2014).

The intrapersonal catalyst subgroup can also be influenced by the quality of TSR within the school setting. The affective quality of positive TSRs have been identified as a foundation for the promotion of school success and a pre-requisite for engaging students in learning (den Brok et al., 2005; Roorda et al., 2011). Under the intrapersonal catalyst falls the subcomponent of motivation. Motivation can be viewed as the internal process that can trigger and support goal-directed behaviour (Matthews & Dai, 2014; Zhang, 2007). When students experience a positive and healthy TSR there has been a strong correlation between student motivation and academic achievement (den Brok et al., 2005). If students are engaged in a negative TSR they run the risk of becoming demotivated, disengaged in learning and experiencing reduced academic success (Misbah et al., 2015; Zhang, 2007).

Posited next to motivation is volition in the DMGT 2.0's catalysts. Volition is the process whereby a person, in this case a student, decides and commits toward attaining the learning goal and partaking in goal-attainment activities. If a gifted and talented student was to experience a negative relationship and develop the above characteristics there is the potential to lack goal direction and minimise efforts in attaining this goal (Gagné, 2004). There is also the potential, through lack of motivation and volition, the student could risk falling into underachievement, as they lack the commitment to push through obstacles and boredom (Gagné, 2004). Having the intrinsic motivation to take learning as far as possible is vital for exceptional accomplishments and the development of talent (Matthews & Dai, 2014). It is,



therefore, essential that pleasure is experienced in the learning process, as it plays a critical role in the students' eventual cognitive and academic outcomes (Matthews & Dai, 2014). TSRs can be a contributing factor that can either hinder or enhance the motivational desires of a gifted and talented student. This could be the key to stimulating and sustaining motivation and developing talent. In some domains of giftedness, affect and motivation have been acknowledged as potentially being more important on talent development than cognitive abilities (Matthews & Dai, 2014).

Objective assessments, such as tests, are another way in which schools can identify their gifted and talented students (Kuo et al., 2010; NSW DET, 2004). This strategy, when comprehensibly applied, can offer an accurate gauge of abilities in the specific domains of giftedness and talent (Reid, 2011). The quality of TSRs have been recognised to be significantly associated with academic achievement (Lang, Wong & Fraser, 2005; McGrath & Bergen, 2015; Roorda et al., 2011; Van Uden, Ritzen & Pieters, 2013). Roorda et al. (2011) found that conflict in a TSR had a large prediction on student performance in future years. Similarly, Cornelius-White (2007) identified a strong connection between the quality of TSR and the resulting student outcomes. Positive TSRs were associated with school engagement and achievement, whereas negative TSRs were associated with poor performance and lack of motivation (Roorda et al., 2011). It has also been identified that a negative TSR is more detrimental to a student's academic achievement than the gains of a positive TSR (Roorda et al., 2011; Telli, den Brok & Cakiroglu, 2008). As academic achievement is strongly connected in giftedness and talent, having a poor TSR could have the potential to disconnect the student from their schoolwork and engagement. This, in turn, has the potential to hinder the identification process, student motivation and overall 'outstanding' academic achievement, which are necessary for the development of talent.

Discussion

The DMGT 2.0 provides a model that outlines the developmental processes that are associated with transforming gifts into talent. The model highlights the interwoven and complex manner that gifts develop into talents through the interaction with the catalysts, intrapersonal and environmental. Intrapersonal catalysts form the physical, mental and motivational aspects that can hinder or enhance the development of an individual's talent. Environmental catalysts draw on the individual and provisional components that must be considered in talent development. What is important is that it is very difficult to isolate one catalyst from the other. They each have a profound impact on one another. TSRs have been highlighted as one of the key and influential aspects impacting students' social, academic, emotional and behavioural domains (McGrath & Bergen, 2015), having the potential to create a positive environment that supports learning, motivation and engagement. A negative relationship formed between a student and a teacher can have deleterious effects on overall engagement and academic achievements of all students, including those considered gifted and talented.

TSRs in gifted and talented education could play a foundational role in the development of gifts into talent. They may impact not only on a gifted and talented student's motivation, volition and academic achievement but also on the initial identification of giftedness. The identification of giftedness is a process that should be



comprehensively implemented in an inclusive and flexible way to ensure that gifted education can flourish. Positive TSRs could be one possible way to ensure that students have the greatest opportunity for identification and success in talent development.

Conclusion

Within the development of giftedness and talent, importance needs to be placed on the building of positive and sustainable TSRs. TSRs have been identified as having significant effects on students in the educational setting, especially in relation to engagement and academic achievement. This paper has attempted to draw together two separate bodies of research and find the connections between them. The effect that TSRs could have in impacting on the catalysts and across talent development has been identified. It is with hope that this paper assists in providing teachers with an understanding of the potential benefits that positive TSRs can have on the development of talent. Future research connected directly with TSRs and giftedness would be beneficial to draw direct evidence-based knowledge on the topic.

References

- Cornelius-White, J. (2007). Learner-centred teacher–student relationships are effective: A meta-analysis. *Review of Educational Research*, 77, 113–143.
- Cornell, D.G. (2004). High ability students who are unpopular with their peers. In S.M. Moon (ed.), *Social/emotional Issues, Underachievement, and Counselling of Gifted and Talented Students* (pp. 31–42). Thousand Oaks, CA: SAGE.
- Davis, H.A. & Lease, A.M. (2007). Perceived organizational structure for teacher liking: The role of peers' perceptions of teacher liking in teacher–student relationship quality, motivation, and achievement. *Social Psychology of Education*, 10 (4), 403–427.
- den Brok, P., Levy, J., Brekelmans, M. & Wubbles, T. (2005). The effect of teacher interpersonal behaviour on students' subject-specific motivation. *Journal of Classroom Interaction*, 40 (2), 20–33.
- Gagné, F. (2004). Transforming gifts into talents: The DMGT as a developmental theory. *High Ability Studies*, 15 (2), 119–147.
- Gagné F. (2011). Academic talent development and the equity issue in gifted education. *Talent Development & Excellence*, 3 (1), 3–22.
- Gagné, F. (2012). *Building Gifts into Talents: Brief overview of the DMGT 2.0*. URL: <https://dl.dropboxusercontent.com/u/17557857/Site%20Web/Site%20Web%20anglais/DMGT%202%20EN%202012%20Overview.pdf> (accessed 28 January 2016).
- Gubbels, J., Segars, E. & Verhoeven, L. (2014). Cognitive, socioemotional, and attitudinal effects of a triarchic enrichment program for gifted children. *Journal for the Education of the Gifted*, 37 (4), 378–397.
- Howard, S. & Walton, R. (2015). *Educational Psychology: Foundations of learning and development*. Macksville, NSW: David Barlow.



- Kuo, C.-C., Maker, J., Su, F.-L. & Hu, C. (2010). Identifying young gifted children and cultivating problem solving abilities and multiple intelligences. *Learning and Individual Differences*, 20 (4), 365–379.
- Lang, Q.C., Wong, A.F.L. & Fraser, B.J. (2005). Student perceptions of chemistry laboratory learning environments, student–teacher interactions and attitudes in secondary school gifted education classes in Singapore. *Research in Science Education*, 35 (1), 299–321.
- Matthews, D.J. & Dai, D.Y. (2014). Gifted education: Changing conceptions, emphases and practice. *International Studies in Sociology of Education*, 24 (1), 335–353.
- McGrath, K.F. & Bergen, P.V. (2015). Who, when, why and what end? Students at risk of negative student–teacher relationships and their outcomes. *Educational Research Review*, 14 (1), 1–17.
- Misbah, Z., Gulikers, J., Maulana, R. & Mulder, M. (2015). Teacher interpersonal behaviour and student motivation in competence-based vocational education: Evidence from Indonesia. *Teaching and Teacher Education*, 50 (1), 79–89.
- New South Wales Department of Education and Training (NSW DET) (2004). *Policy and implementation strategies for the education of gifted and talented students*. Sydney: Author.
- Reid, M. (2011). Teaching implications of gifted and talented learners within the mainstream classroom. *Journal of Student Engagement: Education Matters*, 1 (1), 29–32.
- Reutlinger, M. & Till, K. (2011). The environmental impact. *Talent Development & Excellence*, 3 (1), 95–96.
- Rey, R.B., Smith, A.L., Yoon, J., Somers, C. & Barnett, D. (2007). Relationships between teachers and urban African American children: The role of informant. *School Psychology International*, 28 (3), 346–364.
- Roorda, D.L., Kooman, H.M.Y., Split, J.L. & Oort, F.J. (2011). The influence of affective teacher–student relationships on students' school engagement and achievement: A meta-analytic approach. *Review of Educational Research*, 81 (4), 493–529.
- Rosa, E.M. & Tudge, J. (2013). Urie Bronfenbrenner's theory of human development: Its evolution from ecology to bioecology. *Journal of Family Theory & Review*, 5 (4), 243–258.
- Schwartz, J. (2015). The unacknowledged history of John Bowlby's attachment theory. *British Journal of Psychotherapy*, 31 (2), 251–266.
- Telli, S., den Brok, P. & Cakiroglu, J. (2008). Teacher–student interpersonal behavior in secondary science classes in Turkey. *Journal of Classroom Interaction*, 42 (2), 31–40.
- Van Uden, J.M., Ritzen, H. & Pieters, J.M. (2013). I think I can engage my students. Teachers' perceptions of student engagement and their beliefs about being a teacher. *Teaching and Teacher Education*, 32 (1), 43–54.
- Verenikina, I., Vialle, W., Lysaght, P., Duchesne, S., McMaugh, A., Bochner, S., Krause, K.-L. (2013). *Educational Foundations*. South Melbourne, VIC: Cengage.
- Vialle, W. & Rogers, K. (2009). *Educating the Gifted Learner*. Tuggerah, NSW: David Barlow.



2016, 6 (1), 2–12

- Walton, R. (2014). Mapping MI to the DMGT: A theoretical framework. *Australian Journal of Gifted Education*, 23 (2), 37–44.
- Yu, T.M. & Zhu, C. (2011). Relationship between teachers' preferred teacher–student interpersonal behaviour and intellectual styles. *Educational Psychology*, 31 (3), 301–317.
- Zhang, Q. (2007). Teacher misbehaviors as learning demotivators in college classrooms: A cross-cultural investigation in China, Germany, Japan, and the United States. *Communication Education*, 56 (2), 209–227.