

Applying Vygotsky's zone of proximal development and peer collaboration to pupils with profound and multiple learning difficulties and severe learning difficulties: two case studies

Clare Chalaye and Dawn Male

Introduction

This article focuses on aspects of the work of the Russian psychologist, Lev Vygotsky, and its applicability for children and young people identified as having profound and multiple learning difficulties (PMLD) and severe learning difficulties (SLD); in particular, it focuses on Vygotsky's notion of the zone of proximal development (ZPD) and peer collaboration. A case study approach is used to discuss applicability. The two case study pupils attend a special school for pupils identified as having PMLD, SLD and other complex learning difficulties, including autistic spectrum conditions (ASC). The school caters for pupils aged 4–19 years. The peer interactions of the two pupils, one identified as having PMLD and one SLD, were observed over a term, in their classroom, and other areas of the school.

Vygotsky: the man, his work and its applicability for education

Vygotsky, one of the most prominent developmental psychologists of the 20th century, focused his work and studies on child development and pedagogy (Warford, 2011). He was a prolific writer, despite only living to age 37, and believed that socialisation and culture were critical to the development of the mind.

Vygotsky's experience of social and cultural influence in his own life and that of others around him was significant (Smidt, 2009; Blanck, 1990). He was born in 1896 in Orsha and grew up in Gomel (both now part of Belarus) as a member of a Jewish family, (an

ethnic minority against whom prejudice was common). This was a time when the First World War (1914–1918) and the Russian revolution/civil war (1917–1923) tore families apart and left many children with disabilities.

Vygotsky worked with and studied many children with disabilities, ranging from blindness and deafness, to what he called 'mental retardation.' During and following the wars and dissent in Russia many of these children were abandoned (Warford, 2011). Vygotsky classed mental retardation in three degrees of severity: 'idiots' (most severe, with an average mental age of up to 2 years, but no use of tools or spoken language); 'imbeciles' (with an average age of 2–7 years, use of some language and an ability to carry out simple work, under supervision); 'debiles' or 'morons' (average mental age of a 12 year old with limited higher processing abilities) (Rieber & Carlton, 1993). Clearly, these terms are not used in today's society in the UK, due to the negative connotations implied by the words themselves, but in Vygotsky's time and culture these terms would have been acceptable. However, the first two terms respectively (ie, 'idiots' and 'imbeciles') could be said to equate to children and young people today who have been identified as having PMLD or SLD.

Vygotsky's work with children and young people with special educational needs (SEN)/disabilities impacted on his thinking about pedagogy and education in general, and his observations of the limited interaction between children with SEN/disabilities and people around them were seen by him as increasing the impact of their disability:

'Vygotsky's work with children and young people with special educational needs (SEN)/disabilities impacted on his thinking about pedagogy and education in general.'

‘A disability in and of itself is not a tragedy. It is only an occasion to provoke tragedy.’
(Vygodskya, p 330)

The zone of proximal development and peer collaboration

Vygotsky believed that cognitive development occurs through ‘social constructivism’; that it is through the mediation of one or more other people that pupils make intellectual progress (Loyd, 2007). Vygotsky was the second of eight children, the first male, and it is suspected that he would have taught and been taught by his peers, in a naturalistic family setting in which education was highly valued (his mother was a teacher, his father in banking). This peer teaching or collaboration may have been the starting place for one aspect of Vygotsky’s theory, which he called the ‘Zone of Proximal Development’ (ZPD). This encompasses the development of children’s higher mental functions through collaboration with an ‘expert’ other, be this an adult or a peer who is cognitively in advance of the learner (in the area that they are working) (Smidt, 2009).

He described the ZPD as the difference between a child’s:

‘Actual developmental level as determined by independent problem solving and the higher level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers.’ (1978, p 86)

Vygotsky placed great emphasis on many aspects of development which involved reference to the roles of ‘others’, including thought and language, imitation, higher mental functions, society and the use of cultural tools. It is, however, necessary to talk about culture as all of Vygotsky’s theories revolve around the concept that development is culturally specific. He referred to ‘cultural tools’, which would include real tools such as abacuses, looms and rulers as well as more symbolic tools like language, Braille, mathematical systems, letters and numbers. The tools used by the culture surrounding a child as they grow and develop dictate what they learn. For example, currently in the UK many children competently use tools such as computers and i-Pods at three years old, begin to read and write by five years and are able to interpret abstract non-verbal reasoning tests at 11 years to pass inter-school tests. These skills and competencies may be well beyond the remit of their counterparts in countries such as Brazil, but it would not be uncommon for unschooled Brazilian children

to be able to perform complicated calculations in their head to ensure that when running a mini-enterprise business, selling sweets on the streets, they make a profit (Woolfolk, 2001). It is unlikely that children in the UK of the same age could do this successfully.

Vygotsky also believed that cognitive development occurred in two parts: biological and social with social being most powerful. By biological development Vygotsky meant reflexes and responses, cause and effect type learning and what he considered to be lower level thought processes such as intelligence, memory and attention. Social cognitive development, according to Vygotsky, involved higher mental functioning that is consciously used by the learner, such as planning, abstract reasoning, decision making and targeted attention (Smidt, 2009). Vygotsky theorised that social learning and development happens through collaboration with others; either adult teachers or more expert others, such as peers. The development/learning does not take place through imitation, but through a refining of initial responses by the less competent partner due to the interaction with their more competent peer (Tudge, 1990). These interactions would be determined by the culture and cultural tools surrounding the learners, particularly language. In a special school the interactions could be in the form of Makaton signs, Braille, or symbols (for example).

Vygotsky used the ZPD as a metaphor in which he described the difference between the learner’s actual developmental level (ADL) and the level of potential development (LPD) (Daniels, 2001). He assessed this by calculating the level at which a child performed individually when problem solving – ADL, and then the level at which they could perform when supported by an adult or expert other – LPD (Vygotsky, 1978). The ZPD was viewed by Vygotsky as evolving, rather than being fixed, which he demonstrates when he states that:

‘The zone of proximal development defines those functions that have not yet matured but are currently in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state. These functions could be termed the “buds” or “flowers” of development.’
(Vygotsky, 1978, p 86)

In order for the learner to progress their cognitive development from buds or flowers to fruit, mediation from the adult or more able learner between the less able learner and the

‘Vygotsky placed great emphasis on many aspects of development which involved reference to the roles of ‘others’, including thought and language, imitation, higher mental functions, society and the use of cultural tools.’



Sharing a fun moment; looking at an activity to their left.



Working together to access an activity panel.

environment is necessary to ensure that they receive (what was later termed as) ‘scaffolding’ opportunities (Bruner, 1966). By this Vygotsky refers to support in which the mediator increases help if the learner experiences difficulty and reduces levels of support when they achieve success. This responsive and adaptive collaboration, supported by language, provides optimum opportunity for internal cognitive development (Smidt, 1990).

Vygotsky believed that in addition to this, the level at which the teaching is set needs to be within the ZPD, but nearer to the LPD than the ADL as cognitive development will not occur by teaching a child what they already know. The educational implications for the use of peer mentoring within the ZPD in a classroom setting therefore relies on the teacher as expert assessor of the ADL and LPD of each pupil, providing them opportunities for activities in which scaffolding can occur with a peer of greater ability in an area of learning, aimed towards the pupil’s LPD. However, in a special school this may be difficult to achieve (due, for example, to the abilities of the pupils being similar and the reduced natural interactions of the pupils). Conversely, the small class sizes and high staffing ratios found in special schools may

enable staff to offer their own scaffolding input more easily than in mainstream schools.

In many mainstream classroom settings, children and young people work with peers, whether in groups or pairs or with one pupil designated as a peer tutor. In addition, whether or not this collaboration is planned by the teacher, often children talk and naturally peer-tutor. In a special school, where the children may have limited mobility, communication difficulties and are likely to have an increased staff to pupil ratio, it is likely that interactions between peers, structured situations in which to collaborate with peers and natural peer mentoring situations are somewhat reduced. Vygotsky was very aware of the limited social interactions experienced by children and young people with SEN and believed that many children with disabilities (particularly physical) should be educated in mainstream schools, rather than being segregated and subsequently further separated from natural interactions with mainstream peers (Reiber & Carlton 1993). However, where special education was in use, for children with learning difficulties, Vygotsky believed that this should occur in:

‘... a specially designed setting where the entire staff is able to exclusively serve the individual needs of a child with a disability. It should be a special system that employs specific methodologies because pupils with disabilities require modified and alternative methods of teaching.’ (Gindis, 2003, p 212)

Case studies

From January–April 2011 two pupils were observed working together. The older and more cognitively and physically able pupil was given prompts from adults as to what to do with her peer initially, in relaxed play and snack time sessions, but over time also progressed to using her own initiative during interactions. Below are descriptions of Gemma and Gary (real names are not used to ensure anonymity) and their peer collaboration.

Gemma

Gemma is aged six years. She has been identified as having SLD and is working at P-level 4–6, across the curriculum. She has cerebral palsy and has one significantly weaker side which presents as a slight limp and limited functioning and strength in her right arm/hand. Gemma has a fluctuating hearing loss which means that although she may hear things on one occasion she may not on another. She uses Makaton signs as her main form of communication, although she is beginning to use more single spoken words

‘Vygotsky believed that in addition to this, the level at which the teaching is set needs to be within the ZPD, but nearer to the LPD than the ADL as cognitive development will not occur by teaching a child what they already know.’

and can name familiar objects. Gemma has mild asthma and uses an inhaler if she is wheezy, which can have a negative impact on her behaviour. Gemma lives with her parents, her uncle and her brother and sister. Gemma can be very caring towards others at times, but when she is confused about what is expected of her or is not able to do what she wants to do in school, she may hit out towards adults or peers and sometimes spits at others. Gemma is given considerable help to make sense of what is going to happen next throughout her school day through spoken and signed communication and a Makaton symbol 'Now and next' chart, which helps her to remain calm for much of the time.

Gary

Gary is aged five years. He has been identified as having PMLD, including severe visual impairment. He had infantile convulsions as a baby and was prescribed medication to reduce these at around nine months old. This had a severe impact on his responsiveness to stimuli and made him sleepy for much of the day. In the last year and a half he has been on a Ketogenic diet which has dramatically reduced his seizure activity and he now only has one night-time dose of a medication that does not induce drowsiness and lethargy. Until recently Gary did not show much response to stimuli around him and self-stimulated with his hands, pushing his eyes, exploring his mouth, rolling his eyes back in his head and often bringing his own feet to his face to feel with his mouth. Gary was tactile defensive and was often reluctant to be touched or held by adults, including personal care routines. Gary is able to sit independently but does not stand or walk as yet.

Gemma and Gary at play

Gemma and Gary have been in the same class, with six other peers, one teacher and three support assistants, since September 2011 and previously attended pre-school together. Initially, when being encouraged to work with Gary, Gemma was reluctant to do so, preferring the company of more able peers; she was, however, happy to spend time with Gary and an adult. Gary, Gemma and a teaching assistant, or the class teacher, spent time playing with toys that spun, lit up or played music. Gary was encouraged to touch and spin the different toys and Gemma sat alongside to join in with the play. Gemma responded well to adults making suggestions for things to do with Gary, such as 'Help Gary to spin the spinning tubes' or 'Can you play twinkle, twinkle little star together?' and she would often take his hand to encourage him to explore the toys. After a period of several weeks Gary began to

reach out and touch the toys independently on occasions and three months on he regularly carries out short bursts of independent, self-initiated exploration with his hands.

Gary's limited periods of wakefulness, coupled with Vygotsky's theory that children with disabilities are subject to limited social interaction, are likely to have reduced his opportunities to learn and develop in the past. Gemma provides him with mediation and learning opportunities that would be different to those of adults in that her play is more naturalistic and not goal directed. In these situations Gemma is playing the role of 'teacher' with Gary as her pupil.

Vygotsky believed that play gives a child opportunities to satisfy needs and incentives and that these needs and incentives change as the child develops cognitively. Gary's play is currently exploratory whereas Gemma's is imaginary, though her play is still very much dictated by the objects around her (Vygotsky, 1933). For example, Gemma will play with dolls and will pretend to give her 'baby' a bottle if there is one available. If there is not a real bottle available she would not use another object in place of this (as an imaginary bottle) as developmentally she has not yet reached this stage (Vygotsky, 1933).

Gemma helping Gary with eating

Gary has been gradually introduced to foods that he was not able to have whilst on his strict diet, for example soft, potato based, crisps. Gary and Gemma sit together at the table for snack-time and although Gary holds his bottle to drink he has always been entirely dependent on others for food. An adult previously popped the crisps into Gary's mouth at intervals, often encouraging him to assist with this by holding his hand to the crisp. Gemma was encouraged to help Gary to eat the crisps and has now taken to giving these to Gary herself: she has her own snack then feeds a crisp to Gary. Though Gemma clearly knows and understands the sequence of events in this activity, one observation of Gemma indicated that she is slower at doing this than an adult and can be less accurate at moving the crisp towards Gary's mouth. This appears to have had a significant impact on Gary as relatively soon after Gemma took over giving food, Gary began to meet Gemma's hand with his own as the crisp came near to his mouth and would then guide the crisp in. Over time he has begun to take the crisp from Gemma and pushes it into his mouth independently. Gary now does this consistently and Gemma holds the crisp out around six inches in front of him for him to take (as shown by a supporting adult).

'Vygotsky believed that play gives a child opportunities to satisfy needs and incentives and that these needs and incentives change as the child develops cognitively.'

A ZPD assessment of Gary would be:

- ADL – Gary can put his own hand to his mouth.
- PFL – He can move his hand to his mouth whilst holding a crisp, with assistance.

With his peer (Gemma) scaffolding these sessions and adapting her techniques in response to Gary's improvements at assisting her, Gary was able to internalise the new sequence he needed to carry out to feed himself and has moved forward developmentally, ie he is now able to do what was his previous PFL independently. This now becomes his ADL for a new ZPD. As Gary's class teacher I (the first author) may see this new ADL and recommend that he begins to work with Gemma on a new PFL – taking the crisp from further away or from a table/ tray in front of him (with her assistance initially).

Gemma and Gary trampolining

On the trampoline Gemma bounces standing up whilst Gary sits in front of her and works on maintaining his seated position, using his core muscles. In this situation Gemma is clearly the 'expert other', taking on the role of teacher. She shows her knowledge of the routine carried out on the trampoline and stops at intervals saying and signing 'more' to Gary (sometimes putting his hands together to prompt him to sign). She then pauses briefly to elicit a response from him. This sequence of events would have been observed by Gemma many times and she would have been encouraged to sign/ speak herself in a similar way.

Vygotsky states that pre-school play (the level that Gemma is likely to be working at) meets unsatisfied or currently unattainable needs and incentives; possibly Gemma would like to be the teacher, and this interaction gives her a chance to do so. She keeps to the rules of the play situation she is in, and in role does not become aggressive, as she could out of role, and is always 'sensible' to the point that she shows her understanding of, and uses, cultural tools within her play to sign and say 'more' to Gary to encourage him in turn to sign back to her. Keeping within the rules is essential to the play and Vygotsky describes this need to obey rules thus: 'In play a child is free, but this is an illusory freedom' (cited in Bruner et al, p 542). Sticking so rigidly to rules at such an early developmental level would be impossible in daily life, but Vygotsky argues that in play this is achievable and therefore that '... play also creates the ZPD of the child' (cited in Bruner

et al. p 552) in that children are able to perform nearer to their PFL than their ADL.

Gemma and Gary now

Gemma is now very caring towards Gary since she has been helping him daily; in the case of helping with eating or in play/ learning, her behaviour has improved significantly. Gemma's nurturing side has developed considerably since working with Gary and she now spontaneously approaches other pupils to help or play with them. She has become more independent and shows greater determination with self help skills and taking part in pretend play with dolls and their accessories.

Gary has progressed with his eating, reaching and use of his hands in general and, whereas he previously frequently self-stimulated, this behaviour has been replaced with the exploration of external stimuli. He also enjoys the company of others more, reaching out to hold hands with adults or peers and being far more tolerant of physical touch, particularly tickles!

Concluding comments

These case studies are rich in information and have certainly encouraged the first author to increase opportunities for pupils to work in collaboration with peers and to share these findings with colleagues. With many pupils working at extremely early levels of development it may not be as relevant/ applicable for peer collaboration as it has been with Gemma and Gary, but scaffolding with adults as well as peers can also be encouraged.

Although regression has been discussed as a possible outcome of being the more expert learner in peer collaboration, in this case and in other research (eg, Tudge, 1990) factors such as self-confidence, behaviour improvements, increased maturity and self esteem go un-measured; it would appear that Gemma has gained in many ways from mentoring Gary. Clearly, this is an area which warrants further investigation.

Feedback has been seen to be essential to learners following a problem solving activity (eg, Tudge, 1990) and though this is often given naturally without prompts it would be recommended that teachers are made more aware of the importance of this. Gemma and Gary were both given feedback and praise for their achievements.

One area of concern following observation with peers with SLD and PMLD in a special school would be that, whilst Gary gained so

'These case studies are rich in information and have certainly encouraged the first author to increase opportunities for pupils to work in collaboration with peers and to share these findings with colleagues.'

'The ZPD is probably the most well known aspect of Vygotsky's theory of mental development and makes the most significant educational contribution'

much from being mentored by Gemma (and she, too clearly gained from this interaction) she does not currently have peers within her class who can act as peer-teachers to her. Though the school carries out inclusion sessions with mainstream peers on a regular basis, Gemma does not experience regular interaction with pupils working at a higher level than her as part of her daily routine. This is something to consider for future learning and development for Gemma and other children who are the most able learners in their classes. It is possible that Gemma could be afforded increased opportunities to study or play with pupils in other classes or that further inclusion opportunities may be appropriate for her with children in mainstream schools. In Vygotskian terms this is important as not teaching pupils what they already know and ensuring that they are accessing higher mental including abstract thought (regardless of whether they yet understand these) is necessary to keep children motivated to learn and develop. Vygotsky described this when he wrote:

'Mentally retarded children are not capable of abstract thinking, but a teaching system based solely on concrete principles means that they are never exposed to this higher level thinking and teaching concrete principles is necessary but should be considered a stepping stone to higher more abstract principles without which their cognitive development will not have a chance of ever moving towards to this higher processing.' (1978, p 89)

The ZPD is probably the most well known aspect of Vygotsky's theory of mental development and makes the most significant educational contribution (Daniels, 2001). Most important with the utilization of the ZPD in schools and special schools is the role of teacher as assessor and if peer mentoring is to be an effective tool in the 21st century special school then we must ensure that through adequate teacher training for SEN teachers and further research in this field we help our special children to help each other to reach their full potential.

Clare Chalaye is Head of the Primary Department and a Class Teacher in a School in London. She is also a part-time student at the Institute of Education, University of Education, studying for a Master's degree in Special and Inclusive Education.

Dawn Male is a senior lecturer in psychology and special educational needs at the Institute of Education, University of London.

References

- Blanck, G (1990) *Vygotsky: The man and his cause* in C Moll **Vygotsky and Education** New York: Cambridge University Press
- Bruner, J S (1966) **Towards a Theory of Instruction** London: Harvard Press
- Daniels, H (2001) **Vygotsky and Pedagogy** London and New York: Routledge/Falmer
- Gindis, B (2003) *Remediation Through Education; Sociocultural Theory and Children with Special Needs* in A Kozulin, B Gindis, V S Ageyev and SM Miller (Eds) **Vygotsky's Educational Theory in Cultural Context** Cambridge: Cambridge University Press
- Loyd, D (2007) *Vygotsky: the man, his ideas and their application to individuals with an autistic spectrum disorder* **SLD Experience** 49, 25–33
- Reiber, R S and Carlton, A S (1993) **The Collected Works of L.S. Vygotsky, Volume 2: Fundamentals of Defectology (Abnormal Psychology and Learning Disabilities)** New York: Plenum Press
- Smidt, S (2009) **Introducing Vygotsky: A guide for practitioners and pupils in early years education** London and New York: Routledge
- Tudge, J (1990) *Vygotsky, the zone of proximal development, and peer collaboration: Implications for classroom practice* in C L Moll **Vygotsky and Education** New York: Cambridge University Press
- Vygotskaya, G (1999) *Vygotsky and problems of special education* **Remedial and Special Education** 20(6), 330–332
- Vygotsky, L S (1976) *Play and its role in the mental development of the child* in J Bruner, A Jolly and K Sylva (Eds.) **Play: Its role in development and evolution** New York: Penguin
- Vygotsky, L S (1978) **Mind in Society: Development of Higher Psychological Processes** Cambridge, MA: Harvard University Press
- Warford, M K (2011) *The zone of proximal teacher development* **Teaching and Teacher Education** 27(2), 252–258
- Woolfolk, A (2001) **Educational Psychology** (8th Edition) London: Allyn and Bacon