Knowledge and Teaching

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This is the corrected 12th July version

1. Introduction

The aim of this paper is to examine how two different understandings of knowledge lead to corresponding different approaches to teaching and learning. One approach is 'teaching as instruction', commonly referred to as 'teaching knowledge to the child'. The other is the 'teaching as facilitation' approach, also known as 'teaching the child'. The examination leads into a further discussion concerning how these different understandings affect the role of education more broadly. I argue that how knowledge is understood and the subsequent effects on teaching and learning approaches shape the ways in which education produces and reproduces the collective representations and rationalised individual of the modern world thereby enabling the social cohesion of pluralist societies.

My comparison between teaching as instruction or facilitation begins with Christopher Winch's (1998) plea for a re-evaluation of 'the modern tendency in education of exalting the role of the learner at the expense of the teacher' (p. 63). In the two decades since Winch presented his case, the tendency to see the teacher as a 'facilitator of learning' rather than an 'instructor in knowledge' has only strengthened. However, the rapid growth of a broadly based 'social realism' or 'knowledge in education' research programme (Young, 2008; Maton & Moore, 2010; Moore & Muller, 1999; Muller, 2000; Rata, 2012a; 2012b; Barrett & Rata, 2014; Barrett, Hoadley & Morgan, 2017; Guile, Lambert & Reiss, 2017), also in those decades, suggests that a serious challenge to the facilitation approach is under way. The ideas presented in this paper contribute to that challenge. My purpose is to extend the 'knowledge in education' position by demonstrating the role that instructional teaching plays in linking epistemically structured knowledge to the creation of the rationalised individual. This is the person who is able to both create and engage with modernity's collective representations, or in Pierre Bourdieu's words, its 'shared reality' (1979, p. 79).

2. Types of Knowledge

The 'knowledge in education' writers work within the Durkheimian-inspired tradition of knowledge differentiation, one which distinguishes between what Emile Durkheim called the 'sacred and profane' (Durkheim, 1912/2001, p. 36). According to Young and Muller, (2010) 'It was in the differentiation between the "sacred" as an internally consistent world of concepts and the "profane" as a vague and contradictory continuum of procedures and practices that Durkheim found the social basis of science and the origins of speculative thought (Muller, 2000)' (p. 121). This is the difference between epistemically structured, rational, context-independent knowledge created in the sciences, social sciences, humanities and arts on the one hand and socio-cultural, everyday knowledge or context-dependent knowledge acquired from experience on the other.

However, Durkheim (1912/2001) went further than repeating the reason-experience or 'mind-body' dualism in the distinction he made between the two types of knowledge. He sought to go beyond the 'two conceptions that have collided for centuries' (p. 16) by proposing the 'social origin of categories' (p. 17) of thought. In doing so, he made the case for the sociality of rational knowledge that informs this paper, a sociality also recognised by Popper (1978) as the origin of 'thought contents' (p. 167) or 'products' (p. 161) which emerge from, and contribute to, human thought processes. Both rational knowledge (the term I will use for epistemically structured knowledge from now on) and everyday 'practice' knowledge are 'social' in that the two types are produced by someone in a specific time and place and have effects which act upon the world (Popper, 1981).

In addition, both types are abstract in that all meaning is abstract but, as Bernstein (2000) points out, the distinction is in the '*form* that abstraction takes' (p. 29) in relation to the social context. 'Everyday knowledge has a direct relation to a material base. These meanings are so embedded in the context that they have no reference outside that context; and meanings which are context bound cannot unite anything other than themselves" (p. 30). In contrast, epistemically structured knowledge which has the '*power* of relation outside a context' (p. 30, my italics) is rightly (in my view) called "powerful knowledge" (Young & Muller, 2013). It is a power created in generalisation and universalisation. These two processes are the central features of rational knowledge because they create the indirect relation to context.

Generalisability enables ideas to be used in relation to other immaterial ideas thereby building systems of meaning epistemically. Popper (1978) makes the same point in his reference to these 'thought contents' (he calls them 'abstract World 3 objects') as standing 'in logical relationships' (p. 160) within a conceptual field. These logical relationships are inferences within the epistemic structure; that is, within 'propositional knowledge or Knowledge-that' (Winch, 2014, p. 49).

Logical relationships also exist as material inferences in the complex connections between theories and their application to the real world in the form of 'Knowledge how' (Winch, 2014, p. 49); connections which consists of rules, procedures and practices. It is the complex nature of the connection between the two forms of knowledge; Knowledge that and Knowledge how, which justifies instructional teaching. The process by which a student moves from being a novice in a subject to increasing degrees of expertise requires what Winch (2014) calls 'epistemic ascent' (p. 47). This is the 'important kind of practical knowledge, namely how to make inferences in the material mode (Brandom, 2000) within the relevant conceptual field' (p. 48).

Popper (1978; 1981) recognised that the inferential linking of concepts within an episteme or formal inference stand in 'logical relationships' (Popper, 1978, p. 160). He also addressed the inferential or theoretical relationship between the abstracted idea and the material context. In a significant statement about this relationship, Popper (1978) refers to the possibility of linking ideas and materiality as 'my fundamental argument in support of realism . . . scientific conjectures or theories can exert a causal or an instrumental effect upon physical things' (p. 154). This takes the form of a 'feedback effect' (p. 167) between the products of the mind (propositional knowledge or Knowledge-that) and the processes which create these products (the procedual, practice knowledge or Knowledge-how). As our minds create 'thought contents' which are generalisable because they have an indirect relation to the material world, these contents act back upon human minds to 'largely create them' (p. 167) *and* to create the means of linking the immaterial to the material. This potential for a connection between the "sacred and profane"; between the theoretical and the socio-cultural, is the source of change in modernity. It provides the means by which social relations and forms of organisation are acted upon by ideas that may not emerge from a particular society but that can be applied to it (Popper, 1981; Rata, 2017).

With acknowledgements to the idea of Paul Hirst (1965), Winch (2013), along with the 'knowledge in education' writers I refer to above, recognises the 'close relationship between propositional knowledge and practical knowledge' (p. 130) identified in Popper's writings above *and its implications for teaching*. The connection between the two types of knowledge is reconfigurated according to whether a curriculum designed to produce 'specialised knowledge expertise' is 'arranged according to a conceptually or a contextually dominant *coherence principle*' (Young & Muller, 2014, p. 10). 'Epistemic ascent' is 'the ability to find one's way around the subject through material interference' 'without losing sight of the distinction between "Knowledge that" and "Knowledge how"' (Winch, 2014, p. 49). It depends upon the coherence of curriculum design and teacher instruction which brings a student's attention to the various and complex theory-practice connections.

The indirect relation to context gives rational knowledge its generalisable form. That indirect relations to context also changes the way rational knowledge *functions*. Along with proposing the social origins of rational objective knowledge, Durkheim (1912/2001) addressed this social function; a different social function from that of everyday knowledge; one that is the creative and generative potential of rationality. Durkheim's idea of 'collective representations' (p. 18), which he identified as consisting of abstract 'concepts' (p. 329), refers to the 'product of a vast cooperative effort . . . (consisting of) a very special intellectuality, infinitely richer and more complex than that of the individual' (p. 18). This intellectuality makes up the symbolic sphere of modern societies. The role of education systems in democratic nations is to provide access for all social groups to this sphere, not only for the sake of the knowledge itself (which can in fact be confined to intellectual elites and still be maintained), but because rational knowledge creates modernity's shared sense of reality. In replacing the mythologies which played the same integrating function in traditional societies, rationalised knowledge enables modern societies both to change and to cohere in an ongoing fragile tension. Bourdieu (1979) described the cohesive function of collective symbolic representations as 'mak(ing) possible the *consensus* on the sense of the social world which makes a fundamental contribution towards reproducing the social order' (p. 79, emphasis in the original).

Social cohesion is achieved, despite the historically diverse populations that make up today's pluralist societies, when the symbolic system provides "a homogeneous conception of time, space, number, and cause which makes agreement possible between intelligences" (Durkheim cited in Bourdieu, 1979, p. 79). The education system is the main site for

transmitting this 'agreement'. This is the case because these collective representations provide both the 'means of communication' required for normative agreement and '*the instruments of though'* required to create the thought product (cited in Bourdieu, 1979, p. 79, italics in the original). In other words, ideas cannot be separated from the symbols that communicate them. Durkheim described the link in this way: 'Conversation, intellectual conversation between men, consists of an exchange of concepts. The concept is an essentially impersonal representation: through it, human intellects commune' (p. 329). Jurgen Habermas' theory of a lifeworld, an integrated world of consciousness and communicative action, is within this Durkheimian understanding. (Lechte, 2008). However, the type of knowledge which constitutes modernity's collective representations is difficult to acquire. As the 'instrument of thought' its generalisable form gives it such an indirect relation to context that relating these ideas to context (connecting theory to practice and vice versa) requires a teacher who is able to design and teach a coherent curriculum which makes the connection.

As the 'means of communication' rational knowledge is symbolic and requires a type of language not readily available in the everyday life of the child. It is unsurprising therefore that the nature of the relationship between language and thought is central to the question both of *what* knowledge is acquired and *how* it is acquired. Acquiring the language of a subject is part of this practical know-how ability. It is the means by which collective representations integrate the two types of knowledge so that the socio-cultural is always open to the influence of the new ideas which are created not in the socio-cultural sphere but in the world of ideas themselves. As Pagondiotis (2005) notes, with reference to Geach (1957), 'the capacity to have concepts is intimately connected to the capacity to use language: possessing a concept amounts to understanding the meaning of a word' (p. 144). Given that the knowledge 'product' exists (Popper, 1981, p. 159) in the form of 'linguistic entities' (p. 157), it is in the practical activity of communication that these linguistic entities in their form as abstract statements, propositions, theories, and so on are acquired.

The transmission of knowledge as thought (linguistic entities of thought products) and as communication (linguistic capacity to know and use these thought products) occurs at school. Experiences in a child's home and community cannot create the same shared reality with other social groups in today's pluralist societies. Modern nations contain socio-cultural groups that share neither the same historical experiences nor, in many case, the same everyday experiences or 'culture'. Social cohesion in pluralist societies relies on the symbolic system as

the means to achieve that cohesion. Therefore it is through the production and reproduction of the symbolic system within its site in education, that modern pluralist society finds a shared way to represent its imagined collectivity.

Rational knowledge cannot be 'caught'. Its abstract, non-experiential nature means that it is not available to us "in appearance", so must be taught explicitly to succeeding generations. Indeed the complexity of rational knowledge justifies the central position awarded to instructional teaching. According to Winch (1998), '"teaching" is the active transmission of knowledge and technique by an authoritative figure rather than the setting up of situations in which autonomous pupil learning can take place (the 'facilitator of learning' model)' (p. 63). That authority is justified by both the teacher's subject knowledge expertise and the accompanying pedagogic expertise required to transmit the knowledge to others. This expertise includes the ability to design a curriculum which connects propositional knowledge to practice knowledge in order to provide the epistemic ascent (Winch, 2013; 2014) that enables the student to gradually acquire expertise based on this connection.

3. Facilitation Pedagogy

Facilitation approaches to teaching do not distinguish between propositional knowledge and practice knowledge so are unable to provide for the teacher's role in connecting the two types of knowledge required for subject mastery. With reference to Philips' (2000) account of the various interpretations of constructionism and the confusion that exists between constructivism as a theory of knowledge and as a facilitation pedagogy, McPhail (2016a) notes that the crucial distinction is not made between 'the nature of knowledge and the processes of learning' (p. 4).

The facilitation approach belongs to a long tradition of ideas traceable to the romanticism of Rousseau about what knowledge consists of and how it is acquired. It is found in a range of cognitivist theories which work from the premise that concepts are innate to individuals (Winch, 1998). According to Winch (1998) this 'drawing out' of ideas 'supplies plausible-looking reasons for thinking that learning can take place without instruction, practice, memorisation or training' (p. 74). In identifying the effect of 'its prestige as a theory of learning', Winch notes that innatist cognitivist theories have devalued instruction, practice, memorisation or training, hence his call for a re-examination of 'our need for explicit, teacher-

oriented pedagogies' (p. 74).

For reasons which are outside the scope of this paper, but available elsewhere (see Rata, 2012a and b) facilitation teaching and its justifying constructivist ideas have increased in influence since the 1970s in many democratic educational systems. Despite convincing critique (McPhail, 2016a; Phillips, 2000), constructivist ideas have become so normalised that an influential OCED publication, *The Nature of Learning* (Groff, 2012), can assert: 'During the 20th century, the concept of learning underwent important developments. Today the dominant concept is ***socio-constructivist*** – in which learning is understood to be importantly shaped by the context within which it is *situated* and is *actively constructed* through *social negotiation* with others' (p. 3, emphases in the original).

An example of the extent of the influence of the various pedagogies based on cognitivist ideas can be seen in three trends found in New Zealand education. The first is the replacement of 'student' by 'learner' and a decline in the use of the term 'teacher' in education policy documents (Ministry of Education, 2007). The second trend arises from the post-1970s' influence of cultural responsiveness as an educational principle (Lomax & Rata, 2016; Rata, 2017). The idea is that different communities have different ways of understanding the world because they have different experiences. These understandings may be 'drawn out' from the students, hence the link between cultural responsiveness and facilitation which underpins that country's education policy. The unintended consequences are most vividly captured by Alexis Siteine (2016) in her study of teachers' practices which privilege socio-cultural knowledge. She describes a culturally responsive school where all children were grouped according to their ethnicity for lunch meetings. A teacher at the school recalled the students' resistance saying '*They had to be made to go . . . and they basically sat in silence and ate their lunch . . . It was almost the Star of David thing . . . It didn't work . . . We had the best intentions but maybe it needed to be managed differently.*' (p. 7).

The third trend is the extensive promotion of Innovative Learning Environments by the New Zealand Ministry of Education. These are 'learner-focussed and emphasise valued learner outcomes. They encourage collaboration and inquiry, both for learners and teachers, and allow teachers to teach in the style that best suits the needs of diverse learners' (Ministry of Education, 2016, n.p.). The new architectural style of 'classrooms without walls' and a focus on technology enables the 'learner' to be 'self-managing' with the assistance of a facilitating

teacher. However, Graham McPhail's (2016b) study of one such school indicates that a student-centred and process-driven curriculum using an integrated subject approach creates a 'vacuum' in terms of 'knowledge content and sequence' (p. 17).

The limitation of facilitation pedagogy is that it begins with the material – with experiences from students' lives thereby 'privileg(ing) the representational over the inferential' (Derry, 2016, p. 7). The aim of a facilitation lesson is to understand the experience by drawing on how those with the experience understand it. This is the causal knower-knowledge association identified by Maton and Moore (2010) as the source of a debilitating intellectual relativism. It does not mean that academic concepts are not used. However, such concepts will be selected to support the subjectively derived understanding; the understanding that arise from a direct relation to experience thereby lacking the quality of abstraction found in the generality of ideas that do not come from experience. When meaning is derived from real life experience in this way, the concepts are not structured as coherent systems of meaning connected by their internal logical relations and available for connection to the material world of experience. Instead the learning that occurs is built on the student's subjective understanding of experience and limited to that experience, lacking the generalisability potential found in rational knowledge. The intention of the teacher's facilitation is to 'draw out' the experiential knowledge by bringing it to the student's consciousness so that it is available for reflection using 'metacognitive' processes.

However, with this type of subjective 'metacognition', there are no conceptually established criteria to provide the means for reflective judgement. A student will 'reflect on' the knowledge in accordance with his or her familiarity with it. This is likely to support a *preference* for the way of understanding rather than a *judgement* about it that uses objective criteria or norms developed in reason. (My distinction between subjective preference and objective judgement is taken from Rob Moore's [2010] insightful account of the difference.) Experience-based preference may prevent students from making rational judgements. When everything is someone's preference, then to judge the preference is seen to be judging the person, not the idea. In contrast, the idea that judgement is based on norms established in reason is found in inferential theory (Derry, 2016) as well as in Durkheim's ideas of a reason-based collective consciousness. It locates the collective commitment to rule-governed modernity in the development of ideas that are, in Habermas's (2001) words, 'procedual reason put on trial' (p. 30) because they are, in the first place, open to judgement.

The belief that everyone's opinion is equally valid and therefore equally sound is a common feature of facilitation teaching. The teacher's knowledge is considered to be worth no more and no less than the student's. 'We can all learn from one another', 'we just need to know how to find knowledge' become defining mantras. 'Dr Google' becomes the *default* authority in this familiar scenario. The implications of rejecting the 'teacher knows' for the student's 'right' to find the knowledge were most visibly brought home to me in a conversation with a highly respected primary school teacher. He declared, without any sense of irony, that 'anyone' could teach senior school physics. All that was required was a facilitator who would teach 'learners' how to find the information.

4. Instructional Teaching

Instructional teaching, in contrast to facilitation pedagogy, recognises that the academic knowledge to be taught in schools is epistemically structured knowledge; that is, it has an indirect relationship to context. This means that instruction is required in both the episteme itself (Knowledge-that) and in how to connect the abstract concepts to the material world; the process Winch (2013; 2014) calls epistemic ascent. The understanding of ideas, organised as disciplinary or academic subjects according to their epistemic logic or 'morphology' (Gardner, 2004, p. 234), rather than the understanding of experience, is the logic for teaching. This is not to say that the understanding of experience is not also important, but it recognises that ideas do not directly correspond to experience but that they can be connected to experience. Indeed, it is the making of this connection which lies at the heart of teaching and learning. Vygotsky (1962) acknowledges this in his reference to a child' mental development requiring 'the interrelation of scientific and spontaneous concepts' (p. 93).

The issue for curriculum design is how to demonstrate the connection in the arrangement of conceptual knowledge and its material application so that it is clear to students. According to Derry (2016), 'there needs to be at least a degree of propositional understanding in order for 'the application of any concept (to) illustrate the systematic character of knowledge' (p. 9). This importance of understanding a concept as part of a system of meaning is found in Brandom's theory of inferentialism. 'Inferentialism requires that the correct application of a concept is to be understood in terms of inferential articulation, simply put, understanding it as having meaning only as part of a set of related concepts (p. 1).

Systematisation is also important in Vygotsky's (1962) work. He recognised that there is no way into understanding concepts except by starting with seeing concepts 'in a certain position in relation to other concepts, i.e. a place within a system of concepts' (p. 93). He pointed out the importance of the epistemic structure within which concepts are linked *according to their meaning relationship* by saying that 'a concept can become subject to consciousness and deliberate control only when it *is part of a system*' (emphasis added, p. 92). However, 'central to Vykotsky's work is the idea of the social formation of the mind' (Derry, 2014, p. 37) which means that scientific concepts require connecting concepts to the real world of experience. According to Derry (2014), this Vykotskian approach, 'doesn't depend simply on individuals being placed in the required environment where they discover meaning for themselves' (p. 44) as is the case in the faciliation approach. The 'connections are not arbitary' but 'inform the meaning of the concept in the first place' (p. 44), or in Vygotsky's (1962) words cited above, meaning occurs in the 'interrelation of scientific and spontaneous concepts' (p. 93).

This means that inferential connections from the abstract to the material require direct instruction from a teacher. The coherence of curriculum design that is essential to instructional teaching depends upon recognising both the systemic structuration of rational ideas as well as the complex relationship between the epistemically structured concepts and material objects. Concepts exist within the inferential system of meaning of the structured episteme. Because the meaning is in the inferential relationship rather than in an isolated concept *per se* or in the operation of a process, activity or state, students require correct instruction both in the inferences within the episteme and in inferences drawn from the episteme to the application of the concept. This is the to-ing and fro-ing process between Knowledge-that and Knowledge-how captured in Winch's notion of epistemic ascent and in Vygotsky's (1962) idea of 'the interrelation of scientific and spontaneous concepts' (p. 93).

Significantly Vygotsky (1962) argued that although 'the two processes are closely connected', 'scientific and spontaneous concepts develop in reverse directions, (p. 108). In a statement which suggests that concepts "come first" in teaching, Vykotsky (1962) comments that 'scientific concepts supply structures for the upward development of the child's spontaneous concepts towards consciousness and deliberate use. Scientific concepts grow down through spontaneous concepts; spontaneous concepts grow upwards through scientific concepts' (p. 109). Both forms of connections cannot be inferred from experience but must be taught.

Teachers need to be able to 'break down' the epistemic structure in order to elaborate each concept, each connection, each progression up, down, and across the epistemic structure, and between the epistemic structure and the rules, procedures and practices through which the Knowledge-that is connected to Knowledge-how. Using this pattern as the recontextualising principle the teacher's task is to design a sequence of tasks which most clearly reveal the links between each concept and between the concept and the material object to which it may be connected. Without structuring these connections in the curriculum design (connections created in the epistemic structure itself), the knowledge may be presented in 'ambiguous and random ways'. This may lead to 'weak coherence'; an outcome found by Venkat and Naidoo (2012, p. 21) in their studies of teaching number concepts in mathematics classes.

The teaching as 'instruction' approach elaborates (to use a Bernsteinian term) meaning by making visible to students the inferential connections within and between the forms of knowledge. It also 'condenses' that meaning into linguistic symbols (Bernstein, 2000) . The role of language in the condensation part of teaching is as important as the design of the elaboration process. The two processes need to be integrated so that words are identified as symbols of each concept in their complex inferential arrangement within the epistemic structure. It matters that teachers explicitly build academic language into their explanation of the idea that they are explaining. Teachers who pull back from the use of academic language in the belief that these 'difficult' words will increase the level of difficulty for the student have the opposite effect from their intentions. Instead of making it easier to understand a concept, not using the correct academic term means that the student does not have a symbol for the elaborated meaning of the concept.

In addition to the role played by language in providing access to meaning, the recognition of signs plays a crucial cognitive in the abstracting process itself. It serves as a mechanism of abstraction. Pagondiotis (2005) identifies the capability of recognising signs as one which enables disengagment from the immediate context. Accordingly, 'a new level is opened up, the level of reference to things. This, prima facie, presupposes the capacity to disengage the vehicle of the sign from the referent' (p. 146). 'This distancing is a necessary condition for grasping something as past, future, imaginary, possible . . . enabling a host of new connections to be established which lead to a host of new responses'. (p. 146). It contributes what

Bernstein (2000) called the "*power* of relation outside a context" (p. 30), a key feature of rational knowledge which I refer to earlier.

5. The Apostrophe

The purpose of this section is to use the teaching of the deceptively humble apostrophe to draw attention to the function of rules and procedures in the making of the connections between Knowledge-that and Knowledge-how. My choice of the apostrophe may be surprising. However, I remind readers of Vygotsky's prescient warning made in 1934: 'The opinion has even been voiced that school instruction in grammar could be dispensed with . . . our analysis clearly showed that the study of grammar to be of paramount importance for the mental development of the child' (1962, p. 100). The grammar of language is the most accessible of all rule-bound cognitive activity, the defining feature of rationality. It is potentially available to all children because all children use language – the symbolical means to acquire abstract knowledge; knowledge which exists in the form of linguistic entities. For this reason access to grammatical understanding is central to the acquisition of all epistemically structured knowledge. Characterised by rules that create its order and establish patterns and sequences, such knowledge structures the rationalised psychological identity of the modern individual (Durkheim, 1912/2001; Vygotsky, 1962; Winch, 1998; Bernstein, 2000). It also creates the type of social relations necessary for democratic, law-governed, rather than status-based, society (Rata, 2017).

By pulling apart the epistemic structure of this small, but not insignificant grammatical symbol, I make links between its meaning and how the constituent concepts of its meaning might best be arranged for teaching so that students can use their understanding of the systemised concepts to gain increasing degrees of mastery in the use of the apostrophe. Teaching academic concepts involves using the language of the concepts (the condensed symbol) in order to bring the student to the meaning. Making the meaning available to the student occurs by providing both the concept and its symbolic representation, 'the word'. The student learns that the concept is generalisable in its form as a rule. By acquiring the symbol, the student then has the means (the know-how) to apply the rule of the concept in other instances; to follow the norn-governed procedures in other words.

The apostrophe is the symbol of a particular rule that governs written language use. Like other rules about writing, it is part of larger system of rules, or grammars. Students who learn the specific rule about apostrophe use can be alerted to its place within that specific larger system. They acquire the larger message that all writing is based on specific rules with which the writer engages creatively. Indeed, frequent encounters with the underlying message that the rule-bound, procedural nature of modern society (Winch, 1998) contributes to our rationalised psychological identity, will serve the student well in all further encounters with the abstract nature of these rules and their justifying criteria. In introducing the idea of a rule the teacher may compare the rule governing the apostrophe to one the student may have already learned – concerning the use of the comma, perhaps. In learning that the apostrophe rule has its own bounded epistemic structure which means that it can be taught separately from other grammatical rules, the student is familiarised with the similarities and differences found within and between larger epistemic systems. This practice with procedural rules assists in acquiring the inferential nature of those systems.

Another important concept to be taught is that rules governing the use of the apostrophe marker are differently applied depending upon what meaning the writer intends to convey. Here the student receives practice, albeit rather basic (but this is a novice student), in connecting the idea with learning how to apply the idea. The student is asked: is the apostrophe simply showing the shortened combination of two words, as with "it's"? The next question introduces further concepts. Why there is no apostrophe in the other word, "its"? At this point the teacher can go deeper into the meaning of different forms of language use in order to explain the rules about "possession" and "contraction".

These are quite different concepts and students need to be taught that, although they both use the same apostrophe symbol, that marker indicates the difference. The possessive shows the relationship between subject and object in terms of 'ownership'. It also indicates the plural or singular state of the subject. There are several complex concepts here. 'Singular', plural', 'subject', 'object' – all require a teacher who can identify and name them using the correct terms, explain their function in terms of similarities and differences, describe exceptions, and so on – all while providing practice in using the symbols of the complex concepts being explained. The teacher may also turn to the contraction issue otherwise students may misrecognise all uses of the apostrophe as indicating possession. There is no better example

than the perennial 'its' and 'it's' confusion to clarify the distinction between two quite different concepts that each use the same marker.

Is it possible for a student to learn the grammar of the apostrophe without explicit instruction and relying only on using a 'need to know' approach? This is the facilitation approach favoured by modern learning environment schools (McPhail, 2016b) and promoted by the OECD 'Nature of Learning' report (Groff, 2012). The student may be writing an essay and require a knowledge of grammatical rules in order (say) to clarify the relationship between the subject and object of a sentence. In this case, the rule is the use of the possessive. The facilitating teacher may use the 'need to know' moment to teach the ideas behind the use of the apostrophe. It is a personalised approach responsive to an individual student's needs, one considered to be motivating.

There are a number of problems with this approach. It assumes that there is a relationship between a student's 'need to know' and his or her interest in knowing. This may or may not be the case. A student may consider that the meaning of the writing is sufficiently clear without punctuation – a not unknown occurrence. His or her interest may be restricted to the essay content and not concerned with acquiring grammatical rules. It cannot be assumed that, because the teacher thinks the student will want to know about punctuation in order to improve the writing that the student will think the same way. In addition, a need to know approach may mean that some students miss out on the instruction which is directed towards the student with the "need to know" at that particular moment. But more importantly, starting with a Knowledge-how approach without the 'Knowledge-that' to inform the task may limit students from acquiring generalisable ideas that can be used when the student is faced with a task that is similar but not quite the same. This may lead to the 'context-triggered misapplication of fundamental rules ' identified in an engineering study by Smaill, Rowe, Godfrey & Paton (2012). The outcome may be, not only that students do not know the concept, but that they cannot generalise its use in other contexts because they have not been taught the reasons (Knowledge-that) for the rules and procedures (Knowledge-how).

6. Rational knowledge in education

The increasing ability of children to engage with the type of systemic or epistemic knowledge that takes them beyond their socio-cultural context leads to the psychological structuring of

the modern identity. According to Vygotsky's (1962) the 'rudiments of systemisation', once acquired are 'then transferred to everyday concepts, *changing their psychological structure from the top down'* (p. 93, italics added). Emphasising how much the inferential systematic nature of rational knowledge matters to a child's development, Vykoysky notes that it is 'the *absence of a system* [relations of generality] that is the cardinal psychological difference distinguishing spontaneous from scientific concepts (p. 115). It is the modern individual who can apply abstract objective concepts to understanding real life only because those abstract ideas have been acquired and used as rules and procedures in the various "grammars" of modern norm-governed life from the prosaic apostrophe through to complex logic of cognitive mastery. Otherwise we remain in a state of Caliban-like understanding, without the benefit of the type of knowledge that can take us beyond our experiences. This is the rationalised person who, without sharing the experiences of his or her fellow humans, may still share the idea of those experiences. The possibility of a shared morality lies in that shared understanding. Although rationality does not determine a progressive morality, it is a 'pre-condition' for modern society's 'moral integration' (Durkheim, cited in Bourdieu, 1979, p. 79; Rata, 2017).

The very existence of the modern, rational individual depends upon the teaching of abstract objective ideas to successive generations. The alternative is to put our faith in the knowledge of experience alone. Young children who are convinced by the evidence before their eyes that the world is nicely enclosed under a ceiling of blue, the persistence of 'flat earthers' or American 'birthers' suggests that such experiential knowledge has its dangers. This is not a new problem. At the beginning of the modern period Descartes (1637/1956), echoing the Greeks, warned that 'our senses sometimes deceive us' (p. 53).

The primary role of public education systems in modern societies is to ensure the transfer of rational knowledge to succeeding generations. This is the case, because such knowledge is not the socio-cultural knowledge acquired by children spontaneously from everyday experience. Rational knowledge needs to be taught directly and requires years of schooling if it is to be acquired (Young, 2008). Such knowledge is as important to the maintenance of democratic societies as it is to specific disciplines. However, the apparatus of complex, national education systems is not devoted primarily to maintaining disciplinary knowledge. This could be achieved using a small intellectual elite as Collins' (1998) account of intellectual communities throughout history demonstrates. The importance of education as a national public institution

is that it reproduces successive generations into society's collective representations, representations that enable modern society's integration as a democratic polity (Rata, 2017). It is in this function in particular, that the teacher who transmits rational knowledge serves society more broadly than 'doing a job'. Indeed the notion of teaching as a service or vocation contributed to the prestige previously associated with teaching that facilitation cannot claim.

A second reason is to ensure an educated work force to support the capitalist economy. For theorists who reduce education to the economy, this purpose is the main reason for national education systems. However, human beings are more than the sum of their labour and society is more than the operation of the market. In the introduction I discussed modern society's collective self-representations as the means by which it creates the shared reality that enables social cohesion. The socialisation of each generation into those collective representations is the main reason for public education systems. If this were not the case, then education could be privatised and responsive to localised communities only. The role of public education systems in transferring the type of knowledge that ensures the society's future means that decisions about that knowledge, that is, about what should be in the curriculum, are the responsibility of the society as a whole. Like all major decisions in democracies, the selection of knowledge to be taught to each succeeding generation should be vigorously contested so that there is consensus about what the shared reality is. A serious weakness of the facilitation type is that society's responsibility to reproduce the means of its cultural integration (i.e., its collective representations) is abdicated to students, teachers, or localised communities. It becomes unavailable for debate outside those communities.

New Zealand provides an interesting example of a country which has moved to a localised responsive curriculum. The outcome is the weakening of the collective representations required for an integrated society. The national curriculum (Ministry of Education, 2007) still provides those representations in the form of 'principles', 'values', 'competencies', and 'achievement objectives', but the detail of what exactly should be taught and to whom is left to communities themselves. Each school selects its achievement objectives from 'Learning Areas' such as Science and the Arts, 'in response to the identified interests and learning needs of their students' (p. 44). This has led to a shift in the authority for the selection of curriculum content from the Ministry of Education to localised communities. It is reasonable to assume that, without a national curriculum that prescribes what knowledge is to be taught throughout the country, the curriculum is likely to vary considerably. This may lead to the point where a

community's anti-democratic beliefs take priority over the national curriculum's principle of 'Inclusion' which states that the 'curriculum is non-sexist, non-racist, and non-discriminatory' (Ministry of Education, 2007, p. 9).

That there is a shift in knowledge selection authority may be seen in the acceptance by the Ministry of Education of the gendered differentiated curriculum in a fundamentalist Christian school and in a Muslim girls' secondary school (Lomax & Rata, 2016). The restricted nature of the curriculum in both schools is not surprising. Various types of fundamentalist education which promote undemocratic principles are found in all modern nations. Indeed the rise of various forms of ethno-nationalism in tension with the democratic nationalism based on universalist principles demonstrates the ongoing influence of these forces. The dilemma is the degree of toleration for these schools so that democratic principles are not compromised. New Zealand, like other pluralist settler societies, has long used its public education system (established in 1877) to integrate diverse groups, even those with a history of enmity. However, the shift to community responsiveness at the level of the curriculum is a new strategy which may well create division as create the 'unity through diversity' that is intended. When the experience of the community is the source of, and justification for, the knowledge to be taught, it is reasonable to assume that a community's prejudices and discriminatory practices are as likely to be reproduced as those values that align more readily with democratic principles.

7. Conclusion

The argument I have presented in this paper in support of instructional teaching is underpinned by Vygotsky's conception of intelligence. According to Jerome Bruner, Vygotsky understood intelligence 'as a capacity to benefit from instruction' (1962, p. viii), adding that 'concepts and the language that infuses and instruments them give power and strategy to cognitive activity' (p. ix). This is the 'powerful knowledge' (Young & Muller, 2013) that requires a 'knowledge authority' (the teacher) to transmit the knowledge to each succeeding generation. Instructional teaching requires an engaging pedagogy which links the epistemically structured ideas to the rules and procedures for their application to real life. The collective representations created in this process constitute the shared reality of modernity. For this reason, the implications of instructional teaching reach beyond acquiring mastery of

a subject to ensuring that individuals have the symbolic means to be active contributors to modern pluralist societies.

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