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Children's awareness of learning and knowledge: a study of Year 3 pupils' perceptions of the knowledge they need and how it is acquired

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Abstract

Teachers in today's primary schools need to develop their pupils' abilities in preparation for life in a rapidly changing society. Throughout educational research there are frequent reminders of the need to facilitate the development of pupils' autonomy in order to equip them for successful independent, lifelong learning. In a society where increasing sources of knowledge are readily available to children, it is arguably increasingly important to enhance children's processing and evaluating of knowledge claims. In order to do this, it is essential to understand what children already believe about knowledge. Through a small-scale research project, this paper examines existing approaches to personal epistemology and begins to explore the personal epistemological beliefs of children. In a combined approach using survey and focus group discussions, the children explained how they believe they can acquire knowledge and what knowledge will be relevant in their futures.

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Introduction

Teachers in today's primary schools need to develop their pupils' abilities in preparation for life in a rapidly changing society. Throughout educational research there are frequent reminders of the need to facilitate the development of pupils' autonomy in order to equip them for successful independent, lifelong learning. In a society where increasing sources of knowledge are readily available to children, it is arguably increasingly important to enhance children's processing and evaluating of knowledge claims. In order to do this, it is essential to understand what children already believe about knowledge.

The concept of personal epistemology, or what individuals know about knowing, is an increasingly significant field within educational psychology. There is, however, little research focused on the epistemological beliefs of primary school children. I intend to focus on the area of personal epistemology in order to answer my research questions:

1. How do children define knowledge?
2. What do children perceive to be reliable sources of knowledge?
3. How do children believe the knowledge they need for their future development can be acquired?

These questions have been formulated as a response to the existing research, and aim to begin to examine how children's views about the knowledge they need correspond with the curriculum.

Literature Review

In a review of existing personal epistemology research, Hofer (2001) outlined two major theoretical approaches. The first is the product of much early research in the field, viewing personal epistemology as developmental (Perry, 1970; Belenky, Clinchy, Goldberger & Tarule, 1986). While epistemology has been a major field in philosophy for many years, personal epistemology research within psychology began with Perry (1970). Expecting differences in personal epistemology beliefs to be linked to personality differences, Perry found through a longitudinal study of undergraduates that personal epistemology followed a clear developmental pattern.

Other researchers have supported Perry's developmental model (Belenky et al., 1986). Despite differences in their specific stages, all developmental models feature a final stage in which knowledge is constructed through experience and investigation as the individual recognises that there is no omniscient truth (Hofer, 2001). Viewing personal epistemology as one element of cognitive development, Hofer (2001) suggested these developmental theories of personal epistemology have clear links with Piaget's theory of cognitive development. Like Piaget, these researchers argue that individuals go through distinct stages in the development of their thinking about knowledge. It is important to note that like Piaget's stages of cognitive development, these stages of personal epistemology are not completely fixed, which may explain why individuals enter different stages at different ages. For example, while some first year undergraduates in Perry's study had dualistic beliefs, others' personal epistemology beliefs were much more "sophisticated".

More recent research into the development of personal epistemology (Burr & Hofer, 2002), however, has suggested that the process is not as clear as Perry (1970) claimed. An alternative approach was outlined by Schommer-Aikins (2004), who argued that personal epistemology consists of multiple, independent beliefs which may or may not develop at the same rate. Schommer-Aikins established five distinct beliefs about learning. The stability of knowledge relates to the individual's view of knowledge as unchanging or tentative. The structure of knowledge includes the belief that knowledge is formed of isolated bits of information or integrated ideas. The individual's view of the source of knowledge is another independent belief, with individual perceptions ranging from believing that knowledge is transmitted by an omniscient authority or is

constructed individually through reason, evidence and investigation. Finally, the speed of learning and the ability to learn at all are also distinct beliefs.

While Hofer (2001) suggested that developmental theories of personal epistemology are rooted in Piaget's theory of cognitive development, this link can also be made with this alternative approach. Piaget claimed that children's cognitive development is the result of children being exposed to new experiences which challenge their existing knowledge schemas. Through a process of accommodation or assimilation, knowledge schemas are updated or strengthened, enhancing children's understanding of the world. While there are clear stages of development, children's knowledge schemas are only developed through direct experience. Thus if children are never exposed to a certain concept, then their understanding of it is unlikely to develop. Similarly, according to Schommer-Aikins' model, an individual could have sophisticated epistemological beliefs in one particular area, such as the stability of knowledge, but never have reason to question the source of knowledge, consequently maintaining naive beliefs in this area. Additionally, it is possible for an individual to hold different beliefs about different areas of knowledge. For example, an individual could believe that there are many possible views in literature, but only one omniscient truth in mathematics (Schommer-Aikins, 2004).

Schommer-Aikins (2004) was particularly innovative in the development of a quantitative measure for personal epistemology beliefs. Using the five beliefs about learning, Schommer-Aikins (2004) developed a survey consisting of 63 statements, which has allowed researchers to more directly examine links between personal epistemology and learning. While Schommer-Aikins' survey has been successful and adopted by other researchers, Hofer and Sinatra (2010) noted that simply relying on Likert scales can make development appear linear, when in fact simply disagreeing with a statement does not clearly indicate an individual's level of development.

Another approach was outlined by Burr and Hofer (2002), suggesting that personal epistemology cannot be simply understood through stages of development, nor can it be considered to consist of completely independent beliefs. Epistemological studies with young children have found similar developmental processes as those with university students, suggesting that personal epistemology does not follow a straightforward developmental pattern, but that this development is recursive (Chandler, Hallet, & Sokol, 2002). While personal epistemology may be composed of different

beliefs that may develop at different rates, these beliefs could be more integrated than Schommer-Aikins (2004) suggested (Hofer & Pintrich, 1997; Hofer, 2001; Burr & Hofer, 2002). Burr and Hofer (2002) outlined four dimensions of epistemological beliefs which can be divided into two groups. Firstly, the "nature of knowledge" refers to what individuals believe knowledge is, and includes two dimensions: the "certainty of knowledge", consisting of the stability of knowledge and strength of support for knowledge; and "simplicity of knowledge", which is concerned with the notion of knowledge as either lots of isolated pieces of information or as complex, interrelated ideas. The "nature or process of knowing", on the other hand, refers to how individuals come to know. This includes the dimensions "source of knowledge" and "justification of knowledge", which incorporate the ways in which individuals evaluate sources of knowledge and knowledge claims. According to Burr and Hofer (2002), these dimensions develop more as individuals experience more conflicting ideas, necessitating reconsideration of knowledge sources. While more research is needed to support Burr and Hofer's (2002) claims, their approach, being developed from a review of previous research and integration of approaches, appears to be building a more comprehensive view of personal epistemology.

Much research has begun to clearly establish the impact of personal epistemological beliefs on learning. Richter and Schmid (2010), for example, examined whether individuals evaluate knowledge claims by trying to understand the reasoning behind them (connected knowing) or from a detached, objective stance (separate knowing). They argued that epistemology beliefs are fairly stable and influence the development of epistemic strategies, which are a specific type of cognitive learning strategy that individuals use to evaluate unfamiliar knowledge claims, including consistency-checking (looking for evidence to support knowledge claims) and knowledge activation (using existing knowledge to assess knowledge claims). Richter and Schmid (2010) found that students whose epistemological attitudes included separate knowing were more likely to use consistency-checking strategies, and were more likely to focus on the goal of developing their own opinion rather than simply memorizing facts. Individuals' focus on developing their own opinion, however, also led to a greater use of knowledge activation strategies. Both connected and separate knowledge are elements of procedural knowledge (Belenky et al., 1986), and are integrated to some extent, rather than developing independently (Richter & Schmid, 2010). Richter and Schmid's (2010) research fails to establish either epistemological attitude as being more beneficial to

individuals' use of epistemic strategies. Perhaps this is to be expected considering both attitudes are apparent in personal epistemological development (Belenky et al., 1986).

It can perhaps be concluded, therefore, that the development of personal epistemology beliefs can have a positive impact on learning, since it increases individuals' use of epistemic strategies. This leads to a more reflective and evaluative approach to learning, as individuals consider knowledge claims and justifications rather than simply accepting them, which is necessary in developing autonomous, lifelong, independent learners. Hofer and Sinatra (2010), however, argued that more research is needed to establish how epistemic strategies work and influence learning. Personal epistemology has also been linked to metacognition (Hofer & Sinatra, 2010); self-regulation and individuals' views of themselves as learners (Hofer & Pintrich, 1997); motivation (Richter & Schmid, 2010; Hofer, 2001); and beliefs regarding individuals' ability to learn at all (Schommer-Aikins, 2004). Bromme, Pieschl & Stahl (2010) also suggested that 'epistemological beliefs act as an apprehension structure through which the knowledge to be learnt is anticipated' (p. 12), so that unfamiliar knowledge that is beyond pupils' current understanding can be linked to existing knowledge, and reinforced through strategies such as knowledge-activation.

Some research has also been undertaken considering what pupils believe they need to know. This research often has the underlying aim of school and curriculum improvement, suggesting that schools need to engage pupils by linking teaching to children's learning agendas. Such studies have raised issues such as the need for knowledge to be immediately relevant so pupils can see the value of learning (Burke & Grosvenor, 2003); flexible so that knowledge can be used in later life (Burke & Grosvenor, 2003); and that the knowledge children are expected to learn and its value should be clearly conveyed (Ofsted, 2002). In order to provide solutions for these issues, it is necessary to understand pupils' personal epistemologies, in order to address their concerns and values through teaching.

The existing research provides a useful basis for my own investigation. There are, however, many gaps in the field of personal epistemology. Much existing research focuses on undergraduates, with little explanation of the early development of personal epistemology (Burr & Hofer, 2002). Where research has been undertaken with children, this has been generally focussed on making links with other fields and establishing the necessity for studying children's epistemological beliefs (for

example, Burr & Hofer, 2002), rather than specifically examining the nature of children's personal epistemology. Considering this, I intend to focus my own study on children's personal epistemology beliefs, and the knowledge they perceive as important, all of which will impact upon their motivation and learning.

Research Design

Much recent research in the field of personal epistemology has taken a quantitative approach, following Schommer-Aikins' (2004) survey method. While this method has proved successful, there are many criticisms of depending on this approach. Since research suggests that personal epistemological beliefs develop differently according to individual experience, it seems inconsistent to focus on finding general trends instead of understanding individual development. This is supported by an interpretivist approach, which argues that individuals actively construct meaning through their own interpretations of events, and that behaviours and opinions are not fixed, but are fluid and change over time and in different situations (Cohen, Manion, & Morrison, 2007). I therefore adopted a mixed method approach, combining the benefits of both quantitative and qualitative approaches.

Sample

My sample was taken from a small village junior school. The school has recently introduced a creative curriculum, developing links across curriculum subjects. A survey was distributed to a class of 24 Year 3 pupils. From the results of this questionnaire, two groups of four pupils were selected to participate in focus group discussions.

Survey

Aldridge and Levine (cited in Bell, 2005: 13) argued that 'Each survey is unique. Therefore, lists of do's and don'ts are too inflexible. A solution to one survey may not work in another'. Since very little research of children's understandings of knowledge and its acquisition has been carried out to date, I developed my questionnaire based on a combination of existing research. Combining the findings of Schommer-Aikins (2004) and Burr and Hofer (2002), questions were designed to reveal

children's epistemological beliefs in five categories: stability of knowledge; structure of knowledge; source of knowledge; justification of knowledge; and ability to learn. Appendix One shows my questionnaire, highlighting the category to which each question relates.

Conducting my research with young children, it was essential for my questionnaire to be simple and quick to complete. I used a five point Likert scale so children could circle their response to each question, avoiding the use of potentially confusing phrases such as 'strongly agree' and removing the need for pupils to write answers, which may put many off participating. I allowed the option 'not sure' so that children did not feel under pressure to express an opinion about questions they did not want to. Since the questionnaire was designed to highlight overall trends, it was important to ensure that all participants had the same understanding of and opportunity to answer questions (Bell, 2005). I explained the format of the questionnaire and read each question to the whole class, enabling those with weaker Literacy skills to participate. I also ensured that each pupil had enough time to answer the question before moving on.

Focus Groups

As Bell (2005) stated, however, 'Surveys can provide answers to the questions What? Where? When? And How?, but it is not so easy to find out Why?' (p.14). It was therefore necessary to use another method to examine pupils' understandings in more depth, and to elicit some of the reasons behind their answers. In this situation, I felt focus groups would be more reliable than individual interviews. The interaction that I wanted to achieve in the interviews is completely different to that which pupils are likely to expect from me in my role as a trainee teacher. I felt interviewing children in groups would give them more confidence to challenge my questions and disagree with statements that they felt were wrong. Focus groups also allow natural thinking time while others are talking (Lewis, 1992), and opportunities for the collective development of thinking (Smithson, 2000). In this context, children were fairly used to working with different groups, which reduced the risk of a dominant voice, and gave them the confidence to stick to their own opinions.

Research has suggested that the ideal number in a focus group is four (Lewis, 1992). From the questionnaire responses, two distinct groups emerged: those who think school knowledge will be useful in the future, and those who do not. I therefore selected 4 pupils from each category (2 boys

and 2 girls) to participate in the focus group discussions. This was intended to elicit any reasons for the differences in epistemological beliefs, with individuals sharing their arguments and developing them collectively.

My focus group discussion schedule followed a similar format to that used by the ChALK Project (Hargreaves & Kershner, 2010). Children initially participated in a group task, deciding whether statements about knowledge were true or false. This was then followed by group discussion, incorporating the statements and further questions. Finally, children completed an individual activity, suggesting some different types of knowledge people might need in different places, and highlighting which are the most important. Appendix Two shows the discussion schedule and activities.

Ethical Considerations

The intention of this research is to develop my understanding of children's perceptions of the knowledge they need and how it can be acquired, improving my own teaching practice with minimal impact on the participants. I have therefore given careful consideration to the BERA (2004) ethical research guidelines.

My research has been planned so as to cause as little disturbance as possible to the daily running of the school. Where it has been necessary to work with children outside the classroom, timings have been worked out with the class teacher.

I opted to use focus groups to boost children's confidence rather than singling them out for individual interviews. Having worked with the class before carrying out the research, I was able to ask those who I knew would be comfortable talking to me away from their class teacher to participate. From the questionnaire responses, there were several children who could have participated in each focus group. I tried to include children who I know enjoy working together in my focus groups. While this had the potential to lead to more distractions and off-task time, this also meant that children would be more comfortable considering unfamiliar issues and sharing their ideas.

The purpose of the research was clearly explained to those participating. They had the opportunity to leave any questions on the questionnaire that they did not wish to answer. In the focus group discussions, they were given the choice to either participate or return to their lesson. I also asked their permission to record the interview, assuring them that no one else would listen to the recording and that it would be destroyed after my work had been finished. Assumed names have been used throughout to protect the identity of pupils and teachers. I also allowed time at the end of the discussion for children to listen to part of the recording to make sure they were happy with it.

I was very aware of my dual role as a researcher and teacher throughout the research process, and consequently took measures to ensure that this did not cause any anxiety or harm to the participants. While pupils expected me to be in the role of teacher, and to have to do what I asked them to, I reinforced several times that they had a choice to participate in the project. I also ensured that I maintained a focus on children's responses rather than other aspects such as their behaviour. While challenging the participants to consider unfamiliar ideas through my questions, I consciously avoided challenging their responses, so as not to discourage or undermine them. I also wanted to avoid giving the impression that I was looking for a particular answer, which pupils are likely to think is what teachers are doing when they ask a question.

The school already had permission from parents for pupils to participate in research. I therefore explained my research proposal to the class teacher and Head teacher, and received written permission for my research (Appendix Four). Any changes after this permission was received were checked with the Head and class teacher.

Presentation of Results

The responses to my questionnaire and focus group discussions are discussed below, divided into the different categories of beliefs about knowledge which were apparent in the responses.

Definitions of knowledge

In the focus group discussions, children struggled to define knowledge, suggesting that knowledge is some sort of information that is stored inside the brain.

> 'If you're very knowledgeable that means you have lots of things in your head' – Sam N, FG 1.
>
> Knowledge is something that's 'been stored into your brain' – Sophie, FG 2.
>
> 'If you're really good at Maths, you know a lot about it. You've got a big brain' – Josie, FG 2.
>
> Knowledge is 'some stuff in your brain... No that's information... Is it information in your brain?' – Billy, FG 2.

While unsure of an exact definition, the children all agreed that there are different types of knowledge. Focus Group 1 categorised knowledge as 'clever knowledge' and 'not clever knowledge'. They defined 'clever knowledge' as the knowledge they could learn in school: science, Literacy, Maths, art and reading. Throughout the discussion they gave few examples of knowledge that they could learn outside of school: any examples that they suggested were linked to things they had recently been learning about in school such as road safety. During the discussion they focussed on 'clever knowledge', which dominated their ideas of the knowledge they need to acquire. Considering this group claimed in their questionnaire responses that things they learnt in school would not be useful in the future, this is particularly interesting. They clearly identified these subjects as significant types of knowledge, but had difficulty linking them to life beyond school.

Ability to Learn

Figure 1 shows the responses to two statements designed to assess children's perceptions of their ability to learn. The responses appear contradictory. Only 3 agreed that if they don't understand something straight away they will never understand it, suggesting that most believe they are able to learn even if this learning occurs slowly. Simultaneously, a significant number agreed with the statement 'People are born clever or not clever'. There was a similar response in the focus group discussions. While some children recognised that they do not understand some things because they have not tried to learn (as Sophie claimed, 'I don't know any [times tables] 'cause I don't learn them'), there were many more instances when intelligence was attributed to innate characteristics. Despite mentioning not learning multiplication tables, Sophie attributed her classmates' success to natural intelligence rather than hard work: 'Joe was born more intelligent than me'.

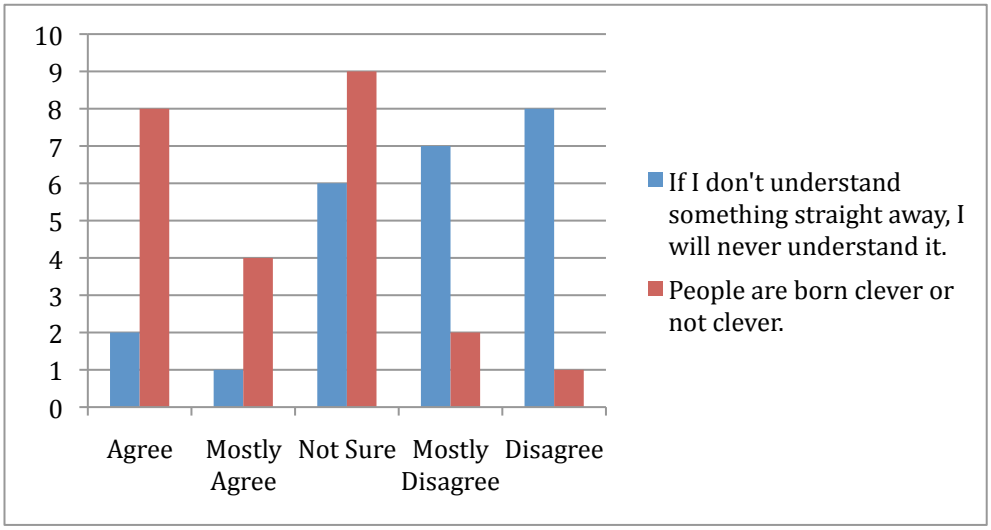

Figure 1: Ability to learn

The children viewed intelligence as an innate, physical attribute. As Billy suggested, '[Intelligence] means you've got a bigger brain to learn'. When asked if people could become more intelligent if they work harder, Billy responded 'it could depend on how clever your mum and dad are'. It is interesting to note that Sophie and Billy are in extension groups for both Literacy and Maths, and in the classroom are generally aware of their strengths, and the fact that they often produce good work whilst spending much time off-task. Further research would be needed to establish whether those in support groups have similar views, and the impact that the belief in one's ability to learn has on achievement and behaviour in the classroom.

Relativity of knowledge

All of the pupils in the focus groups had begun to recognise the relativity of knowledge, but this belief was not sophisticated. Their examples were rooted in school learning, tending to draw on their recognition that they can use different methods to reach an answer rather than having different but equally valid answers. For example, the pupils drew on recent numeracy work on number bonds to support their discussion.

> Josie: You can have a lot of answers to add up to a question.
>
> Sophie: Say if it was ways to make 10, you don't just have...
>
> Josie: 5

Sophie: 5 add 5.

Josie: You can add 9 add 1, 8 add 2...

Structure of knowledge

'Every day at school we learn something different like times tables or topic or forces' – Joshua, FG 2.

'I think it might be true [that knowledge is lots of separate bits of information]. It might be true because we don't only learn one lesson, there's lots of different lessons' – Sophie, FG 2.

While over half of pupils surveyed agreed or mostly agreed with the statement 'Things I learn in one lesson can help me in other lessons', a significant number could not see links between subjects (see Figure 2). Although the school is developing a creative curriculum, many subjects are still taught as separate lessons. Billy recognised that 'some [lessons] link together and some don't', but most of the focus group children agreed with the statement 'Knowledge is lots of separate bits of information'. The children emphasised the fact that the school day is divided into different lessons and that these lessons do not always fit together.

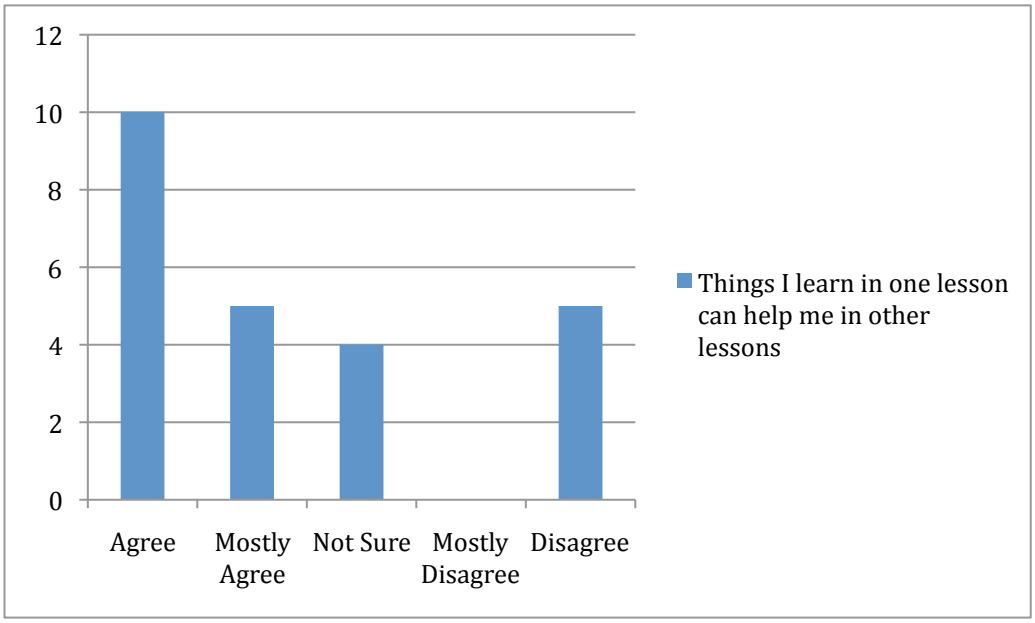

Figure 2: Structure of Knowledge

Stability of Knowledge

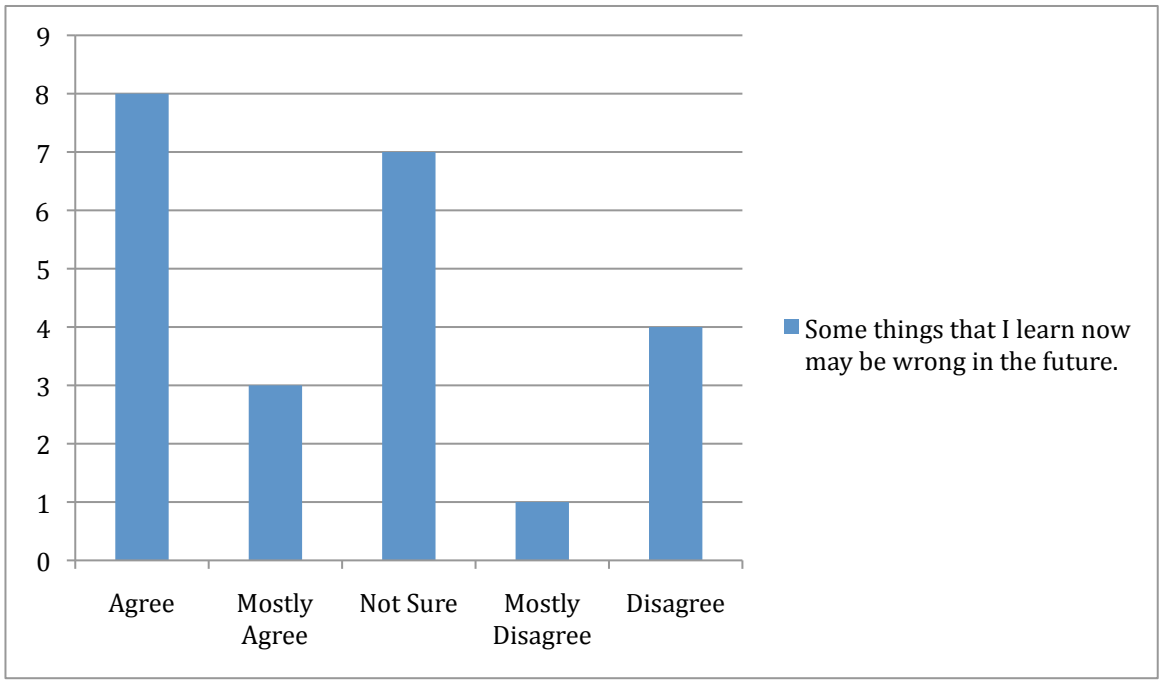

Figure 3: Stability of Knowledge

The survey responses to this concept were mixed (see Figure 3). When given the specific example of science in the focus group discussions, however, both groups agreed that our knowledge may change in the future as we learn more. Focus Group 1 mainly considered that knowledge may change if individuals initially get things wrong:

> Danielle: like if you do an experiment and it's not right, and then you do it again and you get it right.

Focus Group 2 contrastingly discussed that ideas can be developed rather than simply corrected. They concluded that knowledge is constantly changing because we are continuously learning more different information which develops our previous knowledge.

> Billy: [Reads] Our knowledge keeps changing as we learn more.
>
> All: True.
>
> Sophie: I think it's true because when you keep learning more lessons about one lesson then you know lots more things.
>
> Billy: As you get older your brain gets bigger so you can learn more information.

Josie: I think it's true because you learn more and more every day.

Sources of Knowledge

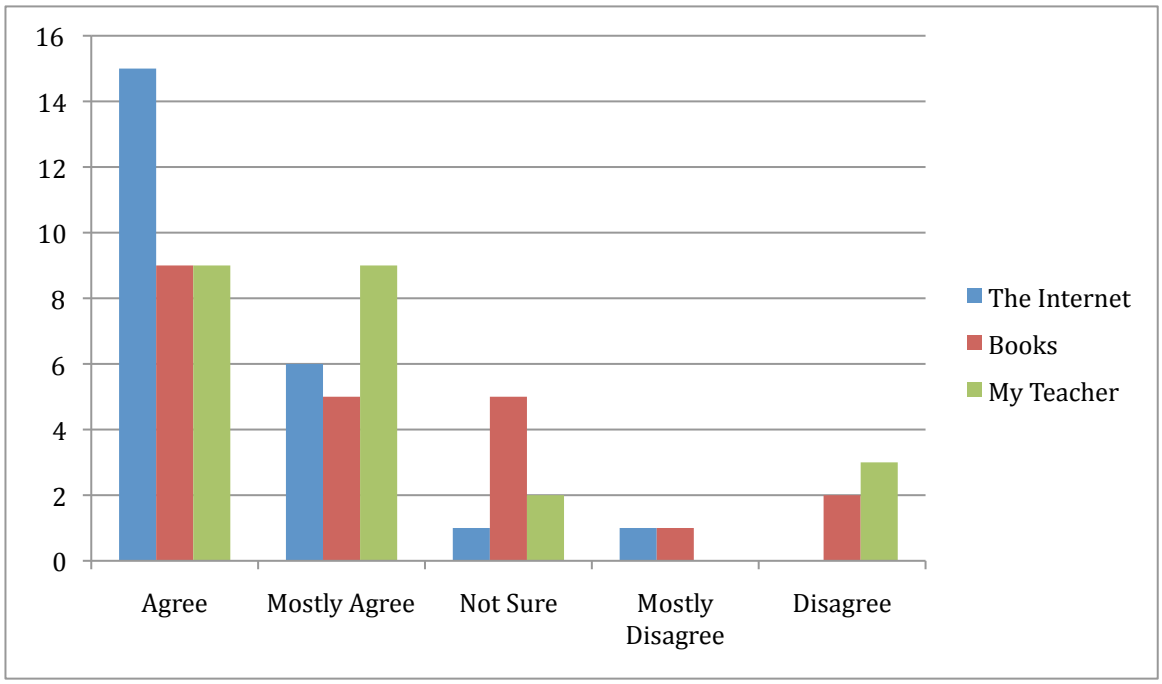

Figure 4: Sources of Knowledge

When asked to consider sources of knowledge in the questionnaire, the majority of children agreed that the internet is a useful knowledge source and none disagreed (see Figure 4). Other sources of knowledge suggested in the questionnaire were less popular. This was clearly reflected by responses in the focus group discussions, where Focus Group 2 claimed that while you could acquire knowledge from books or school, the internet is the best source.

Interviewer: Billy, you said that computers might be the best?

Billy: Yeah, 'cause the teachers might even forget what it is then they would go on the computer to find out.

Sophie: Or computers might be better because the teachers, when it's teacher training day, they might look up on the computers and learn from there.

Billy: And that's why it's better to look on a computer.

The children apparently viewed the internet as an omniscient knowledge source, arguing that other knowledge sources, such as teachers, draw much of their knowledge from the internet. While many children claimed in the survey that they always check information to make sure it is accurate (see Figure 5), the focus group participants were initially confused by the concept that they might have to check that information found on the internet is accurate. When asked how people could check whether information on the internet was true, Sam simply responded 'Oh, that's a hard question'. Focus Group 2 even suggested that there is no way of validating knowledge claims on the internet.

> Billy: But the teachers may find stuff on the computer and even they don't know if it's true.
> Josie: They go online if they don't know it, and if they still don't know if it's true they'll probably teach us something else.
> Billy: Or if they don't think it's true they might learn some more stuff as they get older and find out if it's right.

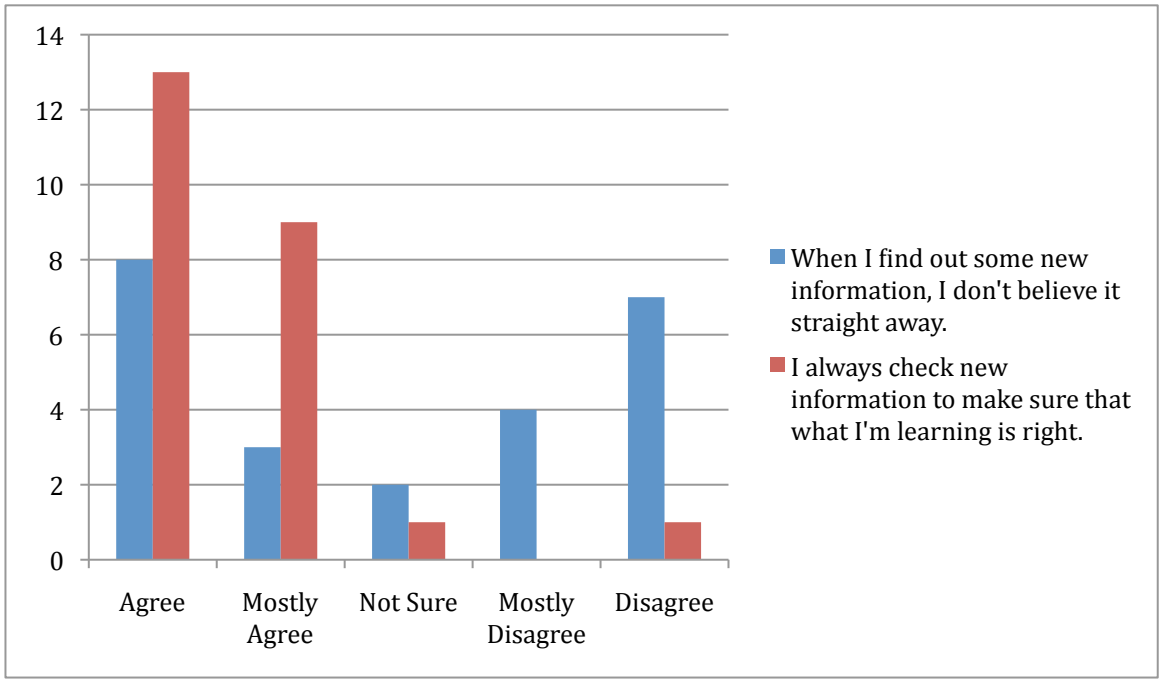

Figure 5: Reliability of Knowledge Sources

It was only towards the end of Focus Group 2's discussion that they suggested that information on the internet is produced by people. Still, the fact that there might be an identifiable author was assumed to be validation in itself that the information must be true.

> Interviewer: How do you think you can tell if things you find on the computer are true?
> Joshua: Because it has a picture of someone saying that he wrote it.
> Josie: Say like if you get this book... you can read it all the way through and then at the end it tells you who wrote it.

The fact that the children were confused by the suggestion that knowledge claims require validation demonstrates Hofer's (2001) linking of personal epistemological beliefs to the work of Piaget. Piaget claimed that cognitive development occurs as a result of a process of accommodation or assimilation, whereby new information challenges existing knowledge schemas requiring them to be updated. Pupils obviously recognised that teachers are not omniscient knowledge sources ('But the teachers may find stuff on the computer and even they don't know if it's true'). With limited experience of using the internet as a knowledge source, however, pupils are less likely to have found knowledge claims there which conflict with their existing beliefs. They consequently have less reason to question the validity of knowledge claims made on the internet.

Necessary knowledge

Following the group discussions, children were given a worksheet to reveal the knowledge they perceive as necessary in different places (Appendix Three). School subjects appeared in both the 'School' and 'Home' sections, with most pupils including spellings and times tables as things they needed to know at home. This reflects their references to homework when asked how they could learn outside of school:

> Interviewer: Are there any other places where you learn things now, apart from school?
> Sam: Home... Times tables, homework and spellings and stuff.

> Interviewer: Where you could learn things apart from school?
> Josie: I know, because we do Springboard and I'm in it. [The Teaching Assistant] gave us some sheets and she said you can do it at home.
> Billy: And we've got some sheets from school to do at home.
> Joshua: A bit like spellings and stuff.

Other necessary knowledge mentioned on the worksheets tended to be practical rather than linked to school subjects. Road safety, e-safety and knowledge about other countries were the most common ideas. The importance of looking after the environment ('not to be a litterbug'), how to

stay safe ('not talk to strangers') and learning their way around their town were also mentioned. This general knowledge was often indicated to be more important than school knowledge.

Usefulness of School Knowledge

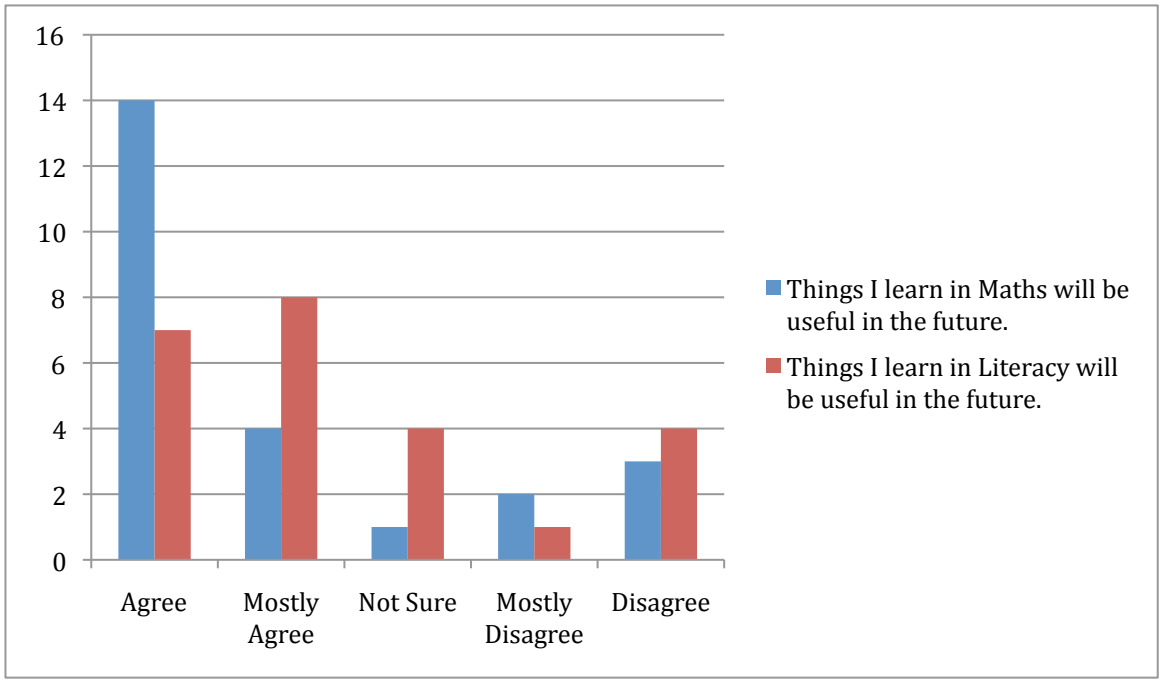

Figure 6: Usefulness of School Knowledge

Surprisingly, twice as many of the survey participants agreed that Maths would be useful in the future than the number who agreed that Literacy would be useful (see Figure 6). From the focus group responses, it appears that pupils can more readily link skills that they acquire in Maths to adult life and employment than those they develop in Literacy. Telling the time and working with money were mentioned by both groups as essential skills, while reading was only mentioned as something which should be learnt in Year 3. It is, therefore, not surprising that many of the suggestions of how school knowledge could be useful outside of school were linked to Maths.

The majority of other subjects were not suggested to be useful beyond the classroom. Those that were mentioned were more practical subjects such as ICT and swimming.

Sam: If you work in a shop or something and say it was like you needed to pay £40 but actually you had £50, so you'd know you have £10 change and that would help you with mathematics.

Interviewer: How might the things you learn in school be useful outside of school?
Danielle: Like if you go swimming... if you go swimming outside of school and you go swimming in school it will help you. Or if you go on holiday and you go in the pool and you sink then you'll know how to swim.

Billy: The stuff you learn in school might be more useful when you're older and you're working or at university.
Joshua: Say like you learn how to work stuff on computers you could go outside and help everyone else out.
Billy: That's basically what I said. Stuff that you learn in school could be useful at university or work. My dad uses a computer all the time at work.

Although they were unable to suggest how most school knowledge might be useful, both focus groups were determined that learning a lot at school would lead to success in adulthood. They explained this, however, by suggesting that learning a lot in school leads to a capacity to learn and opportunities to continue a more relevant education at university.

Interviewer: Does learning a lot at school mean you'll be successful in the future?
Sam: Yeah
Louise: Yes
Daniel: Yes 'cause you're learning and learning things.
Sam: You've probably learnt a lot of stuff.

Interviewer: Do you think that learning a lot in school will help you be successful in the future?
Joshua: Probably.
Sophie: And if you're really good in school you can go to university and get a good job and make loads of money.
Billy: And if you keep going you could go to college for longer and get a better job.

Much research has suggested that the purpose of lessons needs to be explicitly explained to pupils, so that they understand the importance of learning activities (Ofsted, 2002; Burke & Grosvenor, 2003). This school is currently developing a creative curriculum, establishing links between different subjects, as was condoned by pupils in Burke and Grosvenor's (2003) research. Unlike the

successful schools examined by Ofsted (2002) in which 'Without exception, the pupils saw the relevance in the work they were set and this contributed to their positive attitudes to school' (p. 31), pupils in the focus groups were unable to see this relevance in the case of most subjects. While developing links between subjects, it is also essential, according to existing research, to locate activities within a relevant and purposeful context. A 14 year old cited by Burke and Grosvenor claimed that **'**In the present state system, there is a set curriculum that is concerned with efficiency, rather than fulfilment' (2003: 65); there is often a focus on meeting the demands of the curriculum rather than allowing pupils to fully understand a topic and its purpose. Finally, Burke and Grosvenor (2003) emphasised the importance of placing school learning within a wider context so that pupils can respond to a need to understand for a purpose other than passing tests. The fact that the focus group pupils could not suggest how school knowledge would be useful outside of an educational context reinforces the work of Burke and Grosvenor.

Learning beyond school

There was a clear difference between the focus groups in response to the question 'Do you think you'll learn everything you need to know for the rest of your life in school?' Despite having indicated in the questionnaire that they did not think school knowledge would be useful, the pupils in Focus Group 1 agreed that they would get 'pretty much' all of the knowledge they need from school. The only thing they suggested they might not learn was linked to their extra-curricular activities:

> Interviewer: What might you not learn from school?
>
> Danielle: Like how to do gymnastics properly with parallel bars.

Focus Group 1 eventually came to the decision that the only way people might not learn everything that they need in school is if they miss lessons:

> Daniel: And if you miss some lessons, like you're really ill and you can't do those lessons for the whole week, then you might not know Literacy.

Focus Group 2 on the other hand, who had stated in the survey that they thought school knowledge would be useful in the future, recognised that they would continue learning after school and that school might not teach them some important skills.

> Interviewer: Do you think that you'll learn everything you need to know for the rest of your life in school?
> All: No
> Billy: You don't have long enough, 4 years or 6 years isn't very long to learn everything.

School improvement

Considering the fact that the focus group children seemed to prioritise school knowledge, or 'clever knowledge' as they described it, it is hardly surprising that they offered very few suggestions for how their school could be improved to allow them to acquire more of the knowledge that they need. Focus Group 2, however, suggested that school could teach them more practical skills which would be relevant in their adult lives. Having pointed out that their parents regularly used computers at work, the group suggested they should learn more about computers in school.

> Joshua: And you might not learn how to fix computers and switch wires around... You'd need some more computers.

They also suggested that it would be useful to learn more about 'how to fix cars and all that' (Sophie), and that they could learn more about history through practical work:

> Joshua: You could learn knowledge from an excavation dig about dinosaurs and stuff.

Conclusions

One of the most significant points raised was that pupils repeatedly mentioned the importance of school subjects, especially Literacy and Maths, but were generally unable to explain how they were useful beyond school. It is also interesting that Focus Group 1, who claimed school knowledge wouldn't be useful in the future in the survey, were even more focused on school knowledge and struggled to think of other types of knowledge that would be important. The elements of school knowledge that they did highlight as potentially being useful in the future tended to be practical

skills like road safety, e-safety and swimming. All believed that they would have to carry on learning after school in order to acquire the knowledge that they need for work, with particular attention being paid to ICT and the fact that many jobs require using computers.

I was surprised by the survey response that more pupils thought Maths would be useful in the future than Literacy. Most examples of knowledge which would be useful in the future and things they need to know were linked to Maths rather than Literacy. While Literacy lessons are often not linked to real-life situations, elements of Maths such as working with money and telling the time are. Although reading was mentioned as something pupils need to know by the time they finish school, they were not included in any examples of ways in which school knowledge could be used outside of school.

Finally, my findings support the work of Schommer-Aikins (2004) and Burr and Hofer (2002). The elements of personal epistemology outlined by Schommer-Aikins, which influenced my survey and focus group discussion schedule, appear to develop independently, in response to individual experiences. Furthermore, some pupils, especially when questioned further in the focus group discussions, displayed rather sophisticated epistemological beliefs. Some recognised, for example, the relativity and instability of knowledge. This mirrors Burr and Hofer's (2002) argument that personal epistemology undergoes recursive rather than linear development, as individuals continuously update their epistemological beliefs in light of new information. It would be interesting for further research to examine the development of children's epistemological beliefs as they are introduced to new knowledge sources or knowledge claims which challenge their existing beliefs.

Evaluation of Methodology

My mixed methods approach worked well to provide an overview of the perceptions of the class, while also allowing in-depth exploration of some of the explanations behind these views. Since the views expressed by individuals cannot be generalised to represent the whole class, it would have been interesting to include all pupils in a focus group. This, however, would have proven too time-consuming and disruptive to children's learning.

As Bell (2005) suggested, since surveys aim to describe *and compare* the views of large samples, it is crucial to ensure that all participants are asked the same questions in the same context to avoid introducing bias. I read the questions aloud to the whole class, enabling those with weaker Literacy skills to comprehend the questions. This also allowed me to explain the format of the questionnaire to those who were confused by the Likert scale.

While my survey provided an overall impression of children's perceptions of knowledge, it was unable to explain individual beliefs (Bell, 2005). Focus groups were therefore essential, developing my understanding and beginning to explain the survey responses. This is particularly true when considering that some survey responses were unexpected and not considered when designing of my questionnaire. The focus groups were consequently necessary to make sense of the questionnaire responses.

The focus groups often appeared dominated by more assertive individuals (Smithson, 2000). Since I knew the pupils before the research began, however, I knew that they would be comfortable working with one another. While some children were more talkative than others, there were many times when pupils disagreed with one another, and were confident enough to justify opinions that others disagreed with. The proceeding individual written task also gave pupils the opportunity to express ideas that they did not want to share with the group.

It should also be considered that focus groups involve 'a carefully planned discussion designed to obtain perceptions in a defined environment' (Kreuger cited in Smithson 2000:104). They are by no means natural conversations, and are heavily influenced by their context. The semi-structured schedule, my role as a trainee teacher and the fact that the discussions took place in school could all have influenced the responses. In many ways, however, this proved useful. While pupils struggled to think of other places in which they learn outside of school, the main focus of my research is school knowledge. Within the school setting, pupils were reminded of things they had learnt in school and consequently produced more ideas and justifications for their responses.

Overall, my methodology was successful. Having elicited individual perceptions, I was able to see how pupils developed these ideas collectively, stimulated by one another's opinions. They built on

one another's suggestions, often coming to collective conclusions about definitions of knowledge, the usefulness of school knowledge and ways that school could better meet their learning needs.

Implications for Future Practice

Through this research, it is clear that personal epistemology, as Schommer-Aikins (2004) suggested, develops in response to individual experience. These beliefs differ completely between individuals, even those who live and learn in the same places. Considering suggestions that personal epistemology impacts upon classroom motivation and behaviour (Richter & Schmid, 2010), it is vital to elicit individuals' epistemological beliefs and tailor teaching and learning to develop or challenge these.

Especially important is the individual's belief in the ability to learn. I was surprised that many children believed that people are born either intelligent or unintelligent. The attribution of intelligence to nature rather than hard work can be detrimental in the classroom, as suggested by much self-efficacy research. For pupils of all abilities, this belief could potentially cause disengagement, as individuals perceive that hard work and effort in learning activities is futile. In my future planning and assessment, I need to incorporate opportunities to challenge this belief. Praising effort rather than achievement and clearly indicating to pupils where their work has improved are possible ways of challenging the belief that the ability to learn is determined at birth. It could also be beneficial to plan more problem-solving activities to encourage skills such as perseverance and building on mistakes. It would be interesting to examine the impact of such activities on personal epistemology in further research.

Another key concept that has arisen is that individuals do not develop epistemological strategies for validating knowledge claims until they encounter knowledge claims which conflict with their existing beliefs. In my future practice, I believe it would be beneficial to my pupils to provide opportunities to challenge knowledge claims, especially in ICT. Pupils in my research saw no need to challenge knowledge claims made on the internet. Demonstrating the necessity of validating these knowledge claims would enable pupils to develop epistemological beliefs and strategies, allowing them to become autonomous learners.

It will also be important to incorporate more practical skills which pupils perceive as being directly relevant to their present and future lives into my teaching. From my experience teaching the class, they are highly engaged in subjects such as swimming and ICT, which they identified in the focus group discussions as being useful outside of school. Integrating ICT and practical skills into other lessons would likely make them more stimulating and engaging.

In my opinion, the most significant point raised in this research to consider in my future teaching practice is the fact that many pupils viewed school knowledge as being irrelevant to their lives beyond school. While the school is developing a creative curriculum, building links between curriculum subjects, this is not necessarily enough to engage all pupils. I believe it is essential to link this curriculum with the world beyond school, providing a relevant and exciting context for learning activities. Clearly demonstrating to pupils how their school learning will be useful in wider society and explaining why the curriculum is necessary, could potentially increase engagement. It is vital, as Burke and Grosvenor (2002) also found, to make all learning activities meaningful with a clear purpose and use beyond school. I especially need to incorporate this into my teaching of subjects such as Literacy, which many of the children in my research saw as being of little use after school and the SATs tests.

Finally, it is hugely important to consider the perceptions of children when developing the curriculum and teaching strategies. These pupils' views of what constitutes important knowledge differed greatly from what is actually taught in schools. It is important to incorporate pupils' values into teaching, demonstrate how new knowledge could be useful and link new ideas to existing understanding in order to engage all individuals in learning.

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Appendix One (Survey)

Do you agree with these sentences? Draw a circle around your answer.

1. **If I don't understand something straight away, I will never understand it.**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

2. **Things I learn in one lesson can help me in other lessons.**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

3. **Things I learn in Maths will be useful in the future.**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

4. **Things I learn in Literacy will be useful in the future.**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

5. **Some things that I learn now may be wrong in the future.**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

6. **People are born clever or not clever.**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

7. **When I find out some new information, I don't believe it straight away.**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

8. **I always check new information to make sure that what I am learning is right.**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

9. **If I don't know something, these things would help me find the answer:**

   a. **The Internet**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

   b. **Books**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

   c. **My teacher**

Agree *Mostly agree* *Not sure* *Mostly disagree* *Disagree*

Appendix Two (Focus Group Discussion Schedule)

STATEMENTS

Pupils given selection of statements about knowledge – decide as a group whether they are true or false.

1. Knowledge is lots of separate bits of information.
2. Some people are born more intelligent than others.
3. There is only one right answer to a question.
4. Our knowledge keeps changing as we learn more.

DISCUSSION

DEFINITIONS OF KNOWLEDGE

- What do we mean by knowing something?
- What is knowledge?
- What different kinds of knowledge are there?
- Can there be more than one right answer to a question? Give an example.
- Will the things we know now about subjects like science always be true?
- How might the things you learn in school be useful outside of school?
- Are some people born cleverer than others?

WHAT DO CHILDREN PERCEIVE TO BE RELIABLE SOURCES OF KNOWLEDGE?

- Where can you get knowledge from?
- How can you tell if information from those places is true?

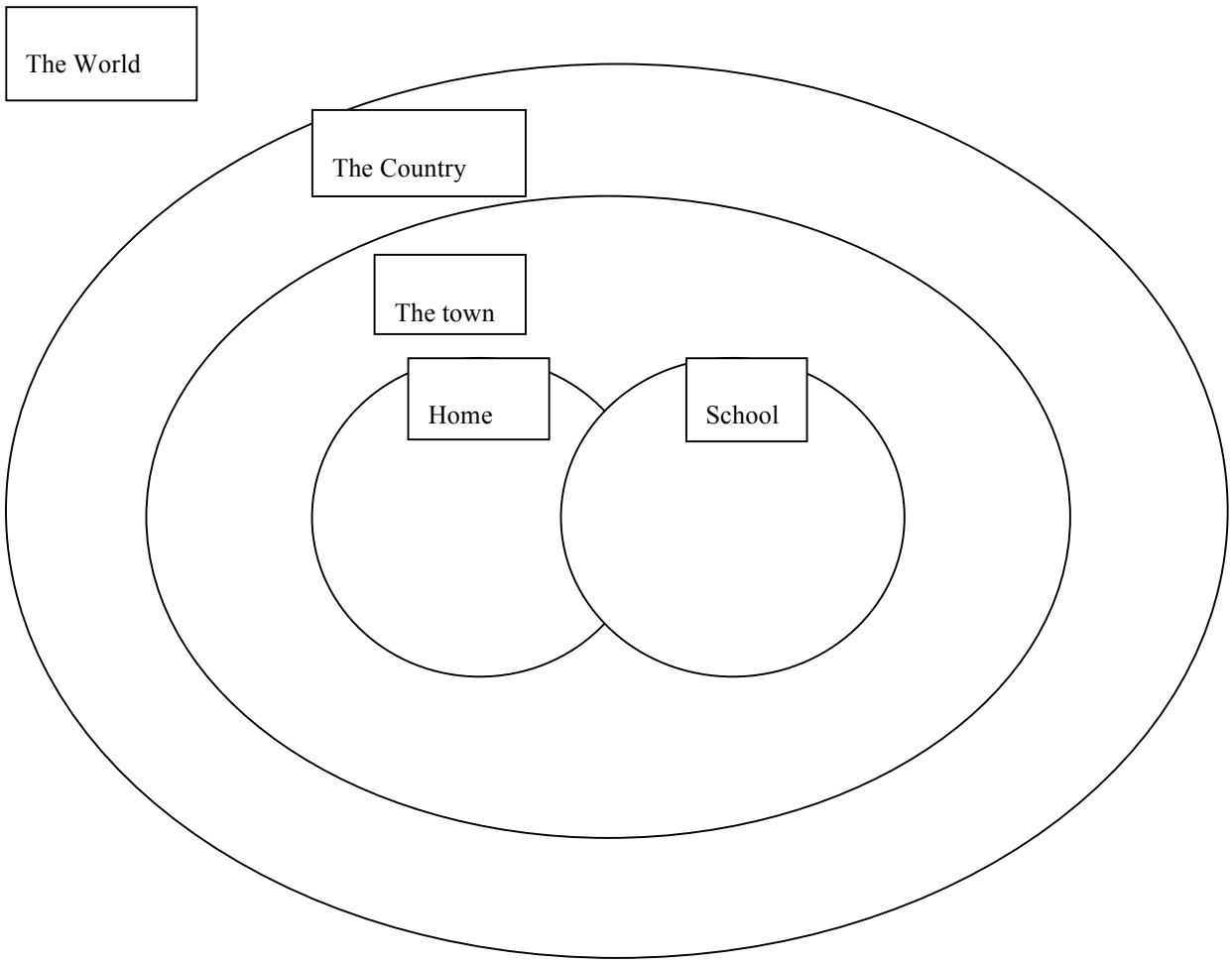
HOW CAN KNOWLEDGE BE ACQUIRED?

- What do you need to know by the end of Year 3?
- What do you need to know by the time you leave this school?
- What do you need to know by the time you finish school completely?
- What is the best way to get knowledge? How do you know? How could you check that information is true?
- Will you get all of the knowledge you need from school?
- Will you carry on learning after you finish school?
- How could school help you to get more knowledge?
- What places could you get knowledge from outside of school?
- Does learning a lot in school mean you will be successful in the future?

INDIVIDUAL ACTIVITY

Pupils each given activity sheet. What things do people know in these different places? Can you sort these things into different groups? Which are the most important things to know?

Appendix Three (Individual Activity Sheet)



Appendix Four (Permission for Research)

UNIVERSITY OF CAMBRIDGE
Faculty of Education

Dear [redacted]

I am carrying out a small-scale research project as part of my Post-Graduate Certificate of Education course. The data from this research will be used in writing an essay focusing on children's perceptions of the ways in which they can acquire the knowledge they need for their future development. The areas that I am investigating are:

- How do children define knowledge?
- What do children perceive to be reliable sources of knowledge?
- How do children believe the knowledge they need for their future development can be acquired?

In order for me to collect information about this topic it will be necessary to interview children and make audio recordings of the interview ready for analysis. The interview recordings that I make will only be used for analysis by myself. All of the recorded material will be destroyed at the end of the 2010-2011 academic year. All references to the school and to the children involved in the research will be anonymised in the essay that I will write using the data.

In order for me to be able to carry out this work I need to ask you to confirm, by signing the reply at the bottom of this letter, that the school's existing permissions are sufficient for me to carry out this work.

Thank you.

Yours sincerely,

Amy Dawe

To Amy Dawe

I can confirm that the existing school permissions are adequate for you to carry out your research work with a group of children from the school.

Signed: [redacted]

Name: [redacted] HEADTEACHER

Name of School: [redacted]

Head of Faculty: Mike Younger MA *Acting Secretary of the Faculty:* Marina Ballard
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