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How do Young People Think They Learn? A Learning Theory Taxonomy Devised from Pupil Preferences

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Abstract

This paper reports the findings from a small-scale survey of school pupils aged 10-18. It places in order of preference, the learning theories of Behaviourism, Cognitivism, Constructivism, Experientialism, Social & Emotional Learning Theory together with the use of Metacognition. The research is qualitative and quantitative, drawing on responses to a survey with follow-up interviews. The responses were gathered from 109 respondents from every school year group from Year 6 to Year 13 in three schools and compared to the responses from a group of teachers for contrast. The research consisted of a survey about common teaching strategies, each reflecting an overarching learning theory, according to findings from the literature review (and shown in Tables 1-6). Once the strategies were placed in order of preference it was possible to filter the data to reveal a learning theory taxonomy. Findings showed that all learning strategies were judged to be of some benefit but Social & Emotional Learning (SEL) approaches were considered the most important amongst young learners. Adults' learning preferences were also surveyed and found to be different to those of young people and there were also marked differences between the sub-groups of young learners: school key stage, possession of a computer at home, and home language. A possible implication of the findings is that it may help teachers to consider the theoretical basis on which they plan for effective learning in the classroom across Key Stages.

Resumen

Este artículo reporta los resultados de una encuesta a pequeña escala aplicada a estudiantes de 10 a 18 años. Sepone en orden de preferencia teorías del aprendizaje incluyendo conductismo, cognitivismo, constructivismo, experiencialismo y teoría del aprendizaje social y emocional, al mismo tiempo que el uso de la metacognición. La investigación tanto cualitativa como cuantitativa analiza las respuestas a la encuesta y entrevistas de seguimiento. La encuesta se aplicó en tres escuelas a 109 participantes de los grados 6 a 13 y las respuestas fueron contrastadas con las de un grupo de maestros. La investigación se basó en una encuesta sobre estrategias de enseñanza comunes que representan teorías del aprendizaje de acuerdo con lo encontrado durante la revisión de la literatura (presentado en las tablas 1-6). Una vez que las estrategias fueron puestas en orden de preferencia, los datos fueron analizados para revelar una taxonomía de teorías del aprendizaje. Los hallazgos muestran que todas las estrategias fueron consideradas de algún beneficio, pero las aproximaciones relacionadas con el aprendizaje social y emocional (SEL por sus siglas en inglés) fueron consideradas las más importantes entre los aprendices más jóvenes. Las preferencias de adultos también fueron investigadas y, al comparar con las de los jóvenes, se encontraron diferencias. Adicionalmente, se encontraron marcadas diferencias entre subgrupos de aprendices jóvenes de acuerdo con grado escolar, presencia de una computadora en casa e idioma hablado en casa. Los resultados podrían ayudar a los maestros a evaluar la base teórica de su planeación para el aprendizaje eficaz en el salón de clases a través de los diversos niveles escolares.

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الملخص:

تعرض هذه الورقة البحثية نتائج دراسة مصغرة أجريت على عينة من تلامذة المدارس الذين تتراوح أعمارهم ما بين 10 و18 عاماً. صنفت هذه الورقة البحثية -بالترتيب وحسب الأفضلية- نظريات التعلم السلوكية والإدراكية والبنائية والتجريبية ونظرية التعلم الاجتماعي والعاطفي إضافة إلى نظرية ما وراء المعرفة. يعد هذا البحث كمياً ونوعياً حيث يستند إلى الأجوبة الواردة في الدراسة جنباً إلى جنب مع متابعة المقابلات. جُمعت الأجوبة من 109 مشاركاً موزعين على مجموعات صافية من الصف السادس وحتى الثالث عشر في ثلاث مدارس، وفُورنت مع أجوبة مجموعة المعلمين لتبيين الفروقات. يتضمن البحث دراسة عن استراتيجيات التعليم الشائعة تعرض كل منها نظرية تعلم شاملة وفقاً للنتائج المستقاة من المراجعات المنهجية للدراسات السابقة والموضحة في الجداول (1-6). كان بالإمكان تصفية البيانات للحصول على تصنيف لنظرية تعلم عندما رُتبت الاستراتيجيات بحسب الأفضلية. أظهرت النتائج أن جميع استراتيجيات التعلم كانت ذات فائدة إلى حد ما، ولكن منهجيات التعلم العاطفي والاجتماعي عُدت الأكثر أهمية من قبل المتعلمين الشباب. أجريت دراسة أيضاً على تفضيلات التعلم لدى اليافعين ووجد أنها تختلف عن تلك التي لدى فئة الشباب، كما لوحظ وجود اختلافات بين المجموعات الفرعية لدى فئة المتعلمين الشباب منها: المرحلة الدراسية الأساسية ووجود جهاز حاسوب في المنزل ولغة التواصل في المنزل. قد تكون إحدى التطبيقات المحتملة لهذه النتائج إمكانية مساعدة المعلمين على اعتماد الأسس النظرية التي يسعون من خلالها إلى التعلم الفعال في الصفوف الدراسية للمراحل الأساسية.

الكلمات المفتاحية
السلوكية، الإدراكية،
البنائية، التجريبية
التعلم الاجتماعي
(SEL) والعاطفي.

Introduction

As teachers, we are constantly firefighting against barriers to learning. Social context, ability levels, screen addiction, class sizes or school funding are all obstacles in our way. As individuals, we are under constant scrutiny from school leaders and inspectors who evaluate whether we contribute to these barriers by way of our pedagogical choices, application of marking policies, planning or personal style. The elephant in the room is the pupil. As Hattie (2015:87) said:

The synthesis of the 1200+ meta-analyses certainly points to the student as the greatest source of variance in learning. *Hattie (2015:87)*

Despite the obvious importance of the young learner, the research that I reviewed was nearly always written from an adult perspective. There was a dearth of literature that explored pupils' opinions on learning and none that I could find where pupils' opinions about learning are linked back to learning theories or are used to test out any particular theory. This research uses a purpose-built survey to put six learning theories to the test. The theories were chosen as they constitute the main theories behind the most common teaching and learning strategies proposed in schools, 42 of which appear in the survey. The participants reflected a range of 93 children: boys and girls, those with English as an additional language and children with a range of prior attainment. 17 adults also took the survey to provide contrast. In the literature reviewed, five overarching learning theories emerged together with the idea of metacognition or "cognition about cognitive phenomena" (Flavell, J.H. 1979:906) associated with better 'self-regulation' (Schraw, G. & Moshman, D., 1995:354 and Zimmerman, B.J., 2002:65) although not a Learning Theory in itself. The review presents the advantages and limitations of each theory as found in the literature reviewed. This research aims to contribute to a discussion about

which learning theories best justify day-to-day classroom pedagogy. One could ask why search for a theory when most theories are debunked. As Skinner (1950:194) said:

It might be argued that the principal function of learning theory to date has been, not to suggest appropriate research but to create a false sense of security, an unwarranted satisfaction with the status quo.

Catania and Harnad (1988:1010) cited Skinner as claiming that “we do not seem ready for theory”. Perhaps ‘teaching and learning’ may not be considered a science. However, if there were a widely accepted, tried and tested, robust theory of learning that informed policy and practice, with the same weight of acceptance as scientific theories, learning could perhaps be more widely guaranteed. In the meantime, we can at least explore some of the major theories about learning by asking pupils. This small-scale research places theories of *Behaviourism*, *Cognitivism*, *Constructivism*, *Experientialism*, *Social & Emotional Learning Theory* together with the use of *Metacognition*, all in order of pupil preference. These particular theories were chosen because the literature showed that they explained the emergence of many of the most common teaching and learning strategies. By asking pupils to evaluate each strategy it was possible to calculate a taxonomy of learning theory preferences. The literature reviewed lends insight into the strengths and weaknesses of the theories and shows how they seemed to emerge one from the other.

Literature Review

Behaviourism

Behaviourists have claimed that pupils learn best using a combination of ‘carrot and stick’ (Thorndike, E., 1933:368). Rewards are associated with control and offering a reward should elicit the desired response (Pavlov, 1927, Skinner, 1971:113 and Thorndike, 1999:16). Neuroscientists, like Ann Kelley (*Neuroscience & Biobehavioural Reviews*, 2012:37(9)) have also found that the brain’s responses to rewards are indeed powerful and linked to memory so that actions that bring rewards are repeated. This seems to support Pavlov’s findings (Richard et al, 2012:12).

However, behaviourism as an educational approach, could be seen to have significant limitations because it is based on the belief that we can shape the environment (Ballard, K.D., 1987:198). Ballard claimed that this ontological position had “led to the assertion that everyone can learn” and therefore imposed a duty on teachers to create methods and resources that mean all children learn “no matter how severe their disability” (*idem*). This view has perhaps increased pressure on teachers to differentiate in classrooms (Taylor, S. 2017:63 and Ballard, K.D., 1987:198). Ballard criticises the target led “zeal for precision teaching” (*idem*), which has taken our attention away from the learner and ignores the “reciprocal, social nature

of teaching” (*idem: p207*). Ballard summarised findings by Coles (1984:324) and Johnston (1985:168):

Teaching and learning are not simply a matter of stimuli and responses but involve fear, confusion, discovery, amazement, warmth, trust and affection (*idem: p.208*).

Although behaviourism might account for much of what we do – fear of failure and promise of reward – it does not explain all the learning that takes place in the human mind, such as language acquisition. Also, modifications to behaviourist approaches were made when research showed that learning was still not secure, despite students following these programmes (Case, R. & Bereiter, C. 1984:142).

Cognitivism

Cognitivism emerged through the influence of Piaget and Bloom and focuses on the mental processes that take place in the mind when learning is happening (Yilmaz 2011:205). Cognitive strategies to improve memory include spacing out study sessions, exposing the learner to the material in a variety of modalities and organising mini tests. Gagné, as cited by Case and Bereiter (1984:144), persisted in tackling the weaknesses in a behaviourist approach by adapting it to include ‘mental skills’ and tested it on mathematics learners, aged eleven and twelve. However, this approach showed that very difficult material, was still found to be difficult, despite the programme. Closer examination reveals the number of ‘sub-steps’ as being “beyond working memory” (*idem: p147*). Other researchers also claim that we have different types of memory and that learning should be programmed to accommodate this (Sweller, J., Van Merriënboer, J. J., & Paas, F. G., 1998:253). Sweller et al. specifically drew attention to how muddled or poor explanations can tax the memory and reduce its capacity to support key facts. They labelled as ‘intrinsic load’ all new information that the brain can take in adding that confusing or overlong explanations weaken the mind’s ability to retain facts due to ‘extraneous load’. Instead, instruction needs to focus more on ‘germane load’ or processes in the mind that will support the intrinsic, key material and allow space for working memory.

Constructivism

Constructivism, with its emphasis on the learner, rather than the teacher, became a dominant and popular idea in education in the second half of the twentieth century. It had its origins in the early writings of Dewey, Piaget and Vygotsky. It was thought that learning took place in the ‘Zone of Proximal Development’ but a ‘More Knowledgeable Other’ was needed to transcend this gap (Vygotsky, 1930:79). Vygotsky “stressed interaction as fundamental to development and learning” (Beck, 2016:101). Where behaviourist teaching and learning tends to be concerned with demonstration and dissemination, constructivist learning involves open-ended enquiry and reflection (*idem: p48*). Barr cites Scheurman (1998) as urging a

constructivist approach to education on ethical grounds although again, there was no evidence of pupils being surveyed in this case.

However, a major criticism of constructivism as found in the literature reviewed was that learners have been found to need specific guidance to proceed. Kirschner et al (2006:76) claim that based on “our current knowledge of human cognitive architecture” long-term memory is the key to learning and where learners are free to discover for themselves, they are not putting information into their long-term memory. They also found that most teachers who start out trying a constructivist approach end up giving a great deal of guidance (*idem: p79*). They claim that the unguided nature of constructivist learning has led to incomplete knowledge and misconceptions or even: “disorganised knowledge” (*idem: p84*).

Experientialism

Experientialism broadly claims that learning is a “process” and that: “ideas are formed and re-formed through experience” (Kolb 2015:37). It is not a new idea. As Aristotle said:

For the things we have to learn before we can do them, we learn by doing them.
(Aristotle, *Nicomachean Ethics*, Book 2, Chase translation (1911).

Experiential learning is “an educational technique” (Kolb, 2014:08) that provides experience of the real world such as work experience. An experiential approach might let pupils control their learning by making choices about what they think is relevant and reflecting as they progress (Moon, 2004:165). It has been claimed that pupils in an experientialist classroom learn better, by using ‘situated learning’, which is when knowledge acquisition is embedded within an activity, rather than discrete from it (Lave and Wenger, 1991:31). Kolb (2014:14) also defines experiential learning as: “a holistic theory of learning that defines learning styles” and also favours the findings of Hickox (1991) and Iliff (1994) who both carried out extensive meta-analyses of over 1000 studies between them. They concluded that experiential learning was found to be positive for between 49% and 61% of cases.

However, the concept of ‘learning styles’ has been questioned by discoveries in the world of neuroscience (May, C., 2018:01) and it could be potentially harmful to learners as it restricts their ability to adapt to new learning methods according to thirty eminent academics “from the world of neuroscience, education and psychology”, who signed a letter to *The Guardian* in May 2017. Kolb created the LSI: The Learning Style Inventory, designed to help learners find their ‘style’, with various upgrades (Kolb & Kolb, 2013:01). Both the LSI, first published in 1976, and the similar idea of Multiple Intelligences (Gardner, 1983) have been cast into doubt from a neurological standpoint (Jones, 2014:02) although no literature was found where pupils were surveyed.

Finally, whilst Aristotle's eloquent statement about 'learning through doing' might be valid in the broadest sense, it does not explain the problems learners have with motivation. We might learn by doing, but how do we come *to want* to do? The next section reviews literature about metacognition its impact on motivation and learning.

Metacognition

Metacognition is widely considered to be the brainchild of John Flavell (1979) although others have noted how Vygotsky's 'Zone of Proximal Development' is essentially metacognitive¹. Metacognition can be beneficial to academic outcomes (Dignath et al., 2013:339). By monitoring our growing knowledge on a subject, we are more likely to learn more about the subject at the same time (Flavell, J.H., 1979:909). Metacognitive strategies to enhance learning have been identified as providing models and diagrams to help students plan, monitor and evaluate their work (Ellis et al., 2014:4019). More recently, claims about improving the speed and effectiveness of learning were associated with a range of metacognitive strategies including creating diagrams of key information (McBride, D. M., & Doshier, A. B., 2002; Read, J. D., & Barnsley, R. H., 1977; Stenberg, G., 2006). Other recent research confirms a strong correlation between metacognition and improved cognition (Coertjens, L., 2018:138).

Findings about the value of metacognition have nevertheless been inconclusive (Black et al., 2006:167) and rather than consciously trying to describe exactly how we are learning, we should let the mind wander as daydreaming could be better for producing creativity, than metacognition (Preiss et al., 2016:417). Neuroscientific research also seems to reinforce doubts about metacognitive 'Mindset' interventions, as the brain is heavily motivated by reward (Ng, 2017:04). Finally, I reviewed literature on the subject of Social & Emotional Learning to see if that was more conclusive.

Social & Emotional Learning

SEL (Social and Emotional Learning) defines learning as dependent on self-management and is "considered a mental ability that involves the ability to reason validly with emotional information" (Mayer 2004:10). Meyer and Salovey (1977:22) first claimed that Emotional Intelligence (EQ) "assists thought". By definition, a lack of emotional intelligence impedes "adaptive processes" *i.e.* learning. Improved EQ has been associated with improved academic performance (Durlak et al., 2011:405). Allegedly, we cannot access learning until our emotional needs have been met and we have the ability to self-manage, make responsible decisions, be socially aware, self-aware and build relationships (Goleman, 1999:24; Zins, J. & Elias, M., 2006:03). SEL is a "process through which learners acquire the skills necessary to manage emotions and thereby make better decisions" (Taylor et al., 2017:115). Emotions towards the teacher can also affect learning (Yun Dai and Sternberg, 2004:18; Frederickson,

¹ (<https://cambridge-community.org.uk/professional-development/gswmeta/index.html>)

2001), as cited by Swanson and Eisenberg (2012:03)). Social learning can also refer to how learners have a powerful influence over each other's cognitive development. Young learners want to catch up with older learners (Ryherd, 2011:31) and other learners help us to identify the gaps in our learning. This is an echo of Vygotsky's Social Development Theory or 'Zone of Proximal Development'. Despite an extensive search, no drawbacks were found for considering the social and emotional component of effective learning although no research was found where pupils themselves had been consulted explicitly about this.

Summary of Literature Review

This research aims to ask pupils how they think they learn. Most of the research found where pupils' views had been sought, concentrated on Primary or Higher Education and were limited to asking pupils' opinions of teachers, schools and specific strategies but none of the strategies were linked specifically to learning theories. Behavioural and Cognitive programmes, analysed in the literature, failed to address some key aspects of learning. Conclusions revealed vague terms for teachers to follow up such as 'intuitive'. Constructivist programmes also were found over complex and have been found to leave learners with gaps in their knowledge.

Meanwhile, theories about Experientialism overlapped with claims about learning styles, which have also been discredited by findings from the field of neuroscience. Metacognition was found to support cognition, but it did not tackle issues around motivation and there was little evidence that pupils had ever been asked if it helps. Social & Emotional Learning was found to be a large umbrella term that addressed thorny issues around motivation but did not always cover important cognitive processes involved in learning. In the absence of a convincing 'one size fits all' theory, I decided to survey pupils to find out which one best helps them learn.

Research Methods

This research tests five learning theories plus the potential usefulness of metacognition, in a small-scale survey made up of 42 common teaching strategies with follow-up interviews. The aim was to find out which theory best describes how young people, aged between ten and eighteen, think they learn. The study was framed in a paradigm of interpretivism. This is to recognise that the research is not based on the "naïve empiricism of either the positivistic, or naturalistic variety" (Hammersley and Atkinson, 1995:20-21). The respondent's judgment about how he or she learns best was the dependent variable. The research has a phenomenologist perspective and aimed to see the point of view of the respondent (Bogdan and Taylor, 1975:14). The limits of interpretivism are evident, as participants offer opinions about how young people learn that might differ from reality (Morrison, 2007:26). The statements in the survey explore interpretations of learning theory in the broadest sense and its findings are constrained by the subjectivity of the responses. An epistemological framework (Watling and James, 2007:355) was used. The research is based on mixed methods using an

explanatory design (Cresswell, 1994:564-568) to triangulate quantitative findings from the survey with rich qualitative data from semi-structured interviews, to derive a better understanding of the subject. The design of the survey increases the transferability of these findings as the views of other, future cohorts could be sought with the same set of questions. The overall mixed-method approach of including follow-up interviews allows added flexibility and “appropriate emphasis at different stages of the research process” (Briggs and Coleman, 2007:31).

Data Collection

To reflect on the survey findings and add insight, semi-structured interviews were carried out. Respondents were not interviewed on the subject of learning theory itself but were asked questions about learning, without knowing to which theory each statement ‘belonged’. The interviews lasted 20 minutes between the teacher-researcher and three pupils at a time. Notes were taken and agreed with the respondent (Burton and Barlett, 2009:89).

Sampling for the Questionnaire and Interviews

For this research ‘Young People’ are defined as school-aged pupils ranging from 10 years of age to 18. A group of adults were also invited to take part, to lend contrast and validity. Contextual factors broadly reflected those that affect learning in the schools surveyed: Over 47 languages are spoken at the schools with over 50% ‘Pupil Premium’. 67.7% of respondents said they speak another language other than English at home and 25% did not have a computer. The pupils attended two different schools: a comprehensive two-form entry primary school and a comprehensive six-form entry secondary in North London. The charts and explanations below show how the survey statements reflected each of the theories.

Testing Behaviourist Approaches

Statements about rewards and failure cover the basis of the ‘carrot and stick’ aspects of behaviourist approaches (Watson, 1927:457). Statement 3 probed the concept of fear, as a motivator, which has been found to abide by the ‘law of diminishing returns’ since too much fear has been found to provoke avoidance tactics (Janis & Feshbach, 1953:91). The research also directly surveyed pupils about whether they feel any benefit from differentiated strategies whereby they may do different work from the rest of the group.

Drilling has been found to correlate to behaviourist approaches (Ahmadian, 2012:380). I also asked if a pupil thinks they learn best when the teacher just tells them the answer: in this case, the pupil may see him or herself as a ‘tabula rasa’ at the beginning of a new topic, waiting for knowledge to be transmitted (Makintosh, 1983:316).

1	I learn more if I am given a reward.	Thorndike (1999:16); Skinner (1971:113) Pavlov, I. P. (1927); (Richard et al, 2012:12)
2	I learn more if I am scared of failing.	Watson, J A (1926:457)
3	I learn more when I am scared that I might be punished in some way.	Janis (1967:193)
4	I learn more if the teacher gives me work specifically designed for me personally.	Ballard (1987:198)
5	I learn more when my teacher ‘drills’ the information – like chanting out loud spellings or the Times Table.	https://gsi.berkeley.edu/gsi-guide-contents/learning-theory-research/behaviorism/
6	I learn more if I find out the answers for myself.	Mackintosh, N. J. (1983:3116).
7	I learn more if I find out how to improve without being told.	Case and Bereiter. 1984:147

Table 1: Survey Statements Evaluating Behaviourist Approaches

Testing Cognitivist Approaches.

Statements to test cognitive approaches included asking pupils to reflect on whether knowledge is best assimilated if it is spaced out (Sisti et al., 2007), broken into very short steps and not over-reliant on memory (Case and Bereiter, 1984:148) and practised frequently (Gagné, 1977). Pupils were also asked about how helpful they found it when the teacher asks questions about the work (Gagné, 1974:16). I included findings from the world of neuroscience that I believe confirm the validity of considering cognitive approaches and in particular, the idea that complex tasks are better for cognitive development than simplified ones (Briggs, S. 2015).

1	I learn more if the lesson starts with some key questions.	Gagné (1974:16) - idem
2	I learn more if the teacher asks me questions to check if I have understood.	Gagné (1974:16) - idem
3	I learn better if the teacher makes us practise something several times.	Gagné, R. M. (1977)
4	I learn more if the teacher breaks down what I need to know into short steps.	Case and Bereiter. 1984:148
5	I learn more if the lesson is easy.	Briggs (2015)
6	I make progress if I don't have to remember a lot of new information.	Case and Bereiter. 1984:148 - idem
7	I remember more if the teacher spaces out the learning.	May, C. (2018); Sisti et al. (2007); Kirschner, P., Sweller, J. & Clark, R.E (2006); Sweller, J., Van Merriënboer, J. J., & Paas, F. G., 1998:253

Table 2: Survey Statements Evaluating Cognitive Approaches

Testing Constructivist Approaches

The constructivist classroom promotes active rather than passive learning (Olusegun, S & Bada, 2015:67). The teacher's role is reduced to a facilitator who creates 'patterns' (*idem*: p68) so that students can connect new, seemingly random pieces of information to a whole. Olusegun claims that the role of the teacher is "rooted in negotiation" (2015:68). Pupils were asked whether they learned better when the teacher acts as a 'guide on the side', as a way of testing this claim. Constructivist approaches build on prior learning (David, L., 2015). Learners in constructivist classrooms work with other students (Vygotsky, 1920:79). To test this, pupils in my case were asked if they think they learn better from "working on their own". Constructivist classrooms also encourage pupils to learn from older learners, perhaps through homework projects (Ryherd, 2011:37). On the matter of homework, I placed Dylan William and Paul Black's work from *Inside the Black Box* (1998:13), in the constructivist section, as they explain that homework (and tests) must be "clear and relevant to the learning aims". I included a statement to this end in the survey, to see how important pupils felt that these links should be.

1	I learn more if I revise the previous learning before I start the next one.	Olusegun (2015:68) David, L. (2015)
2	I learn more working on my own.	Olusegun (2015:68).
3	I learn more from working with someone who knows more than me.	Remmel (2008:80); Vygotsky (1920:79)
4	I learn more if I build on what I already know.	Olusegun (2015:67) Counter - Kirschner et al (2006:76) and Counter - Roth,W. (1998:141-144)
5	I learn more if I think I am catching up with older learners.	Ryherd (2011:37); Yeh and Lempers (2004:143).
6	I learn more if the teacher acts more as a 'guide on the side'.	Kirschner, Sweller, Clark (2006:76)
7	I learn more from homework that links to the lesson.	Black & William (1998:13)

Table 3: Survey Statements Evaluating Constructivist Approaches

Testing Experiential Approaches.

To find out more about the usefulness of experiential learning statements were framed around 'learning by doing'. Pupils were asked if they learn best, using authentic materials, like newspaper articles (Wurdinger, 2005:24). Experientialists advocate 'cognitive apprenticeship' whereby pupils learn from doing but in a very 'real-world' setting, which goes beyond the classroom (Brown, Collins & Duguid, 1989:37). To test this, I asked pupils to evaluate whether they learn better from trying to teach each other. I included a question about 'communities of practice' (Wenger, 2010:02) which I framed as: "I learn better when I feel everyone is learning around me". I also probed the notion of Learning Styles (Kolb, 1984:35) and Multiple Intelligences (Gardner, 1993:11) as these were digested into the educational vernacular and established as basic givens of learner-centred instructional design programmes over many years (Davis et al., 2011:486). To test this, I phrased the statement as: "I learn better if I think the teacher is letting me choose how I learn it for example, on a computer, in pairs or from a book".

1	I learn more from trying to teach other pupils, for example by giving a presentation.	Brown, Collins, and Duguid (1989:37) Lave & Wenger (1991:31)
2	I learn more if I can see a use for the learning, for example speaking French in France or Spanish in Spain.	Kolb (1984:35) Kolb (2015: viii)
3	I learn more when I can try something for myself.	Kolb's Experiential Learning Cycle – https://www.simplypsychology.org/learning-kolb.html
4	I learn more if the classroom mimics a real-world setting or uses authentic texts like newspaper articles.	Wurdinger, S., & Bezon, J. (2009:24). Lave & Wenger (1991:31)
5	I learn more if I can choose the topic to study.	Moon (2004:165)
6	I learn better if I think the teacher is letting me choose how I learn it, for example on a computer, in pairs or from a book.	Kolb refuted by Pashler et al., 2009:116); Gardner (1993:11)
7	I learn more if I see others learning around me.	Wenger (2010:02); Ellis et al (2013:4034)

Table 4: Survey Statements Evaluating Experientialist Approaches

Testing Social & Emotional Learning Theory Approaches

The fifth theory under review was SEL. Questions in the research survey explored how pupils think they learn better if they like the teacher. I included statements to test Social Learning Theory as it explains human behaviour as a “continuous reciprocal interaction between cognitive, behavioural and environmental influences” Bandura (1971:05). The reciprocity element of ‘Social Learning Theory’ places it legitimately in the Social & Emotional Learning category. I also looked at the concept of ‘Emotional Intelligence’ and its impact on learning (Zins, 2006:03; Goleman, 1999:24). I framed this as “I learn better if I think the teacher likes me” which was probed whether pupils thought they could learn despite perceptions of what the teacher might think of them. I included findings from neuroscience, which support the impact of emotions on learning (Moritz-Saladino, 2017). I included recent research that shows personality influences grades more heavily than IQ (Heckman et al., 2016:04). In particular,

conscientiousness is found to be the most important of the five personality traits for its impact on academic outcomes (Borghans et al., 2008:1006) so I chose to ask pupils to evaluate the statement “I learn better if I focus on my mistakes” as this would show a degree of conscientiousness.

1	I learn more from watching someone show me how to do something.	Bandura (1971:05)
2	I learn more if I like the teacher.	Robinson (2014:06)
3	I learn more if I focus on my mistakes.	Moritz-Saladino (2017)
4	I learn more if I am enjoying the lesson.	https://www.brainscape.com/blog/2012/10/breakthroughs-science-of-learning-2/
5	I learn more if I think the teacher likes me.	Heckman et al. (2016:04); Borghans et al.(2008:1006)
6	I learn more if I like the teacher.	Yun Dai and Sternberg 2004:18; Frederickson (2001: 2018-26); Gentilucci (2004:138)
7	I learn more when we have class discussions.	Joseph E. Zins (2006:03); Goleman (1999:24)

Table 5: Evaluating Social and Emotional Learning Theory approaches

Testing Metacognitive Approaches

Mnemonics are metacognitive and widely considered helpful to learning (Ellis, Denton & Bond, 2014). ‘Thinking aloud’ or explaining to oneself (or to others) is a useful metacognitive strategy (Haidar, A. H., & Al Naqabi, A. K., (2008) as cited by Ellis et al., (2013:4019. Predicting what you are likely to get in a test and also tracking your progress are both useful tools for boosting self-regulated learning (Kistner, et al., 2010); (Scharlach, 2008 as cited by Ellis et al., 2013:4018). Metacognitive strategies were found to have a significant effect-size (0.69) by Hattie (2012:256) but it must be noted that this was less than half of the impact of ‘student expectations’ (1.44) which were at the top. Teaching children to have a growth rather than a fixed mindset is supposed to have major effects on academic achievement (Dweck,

2012:57) and this idea has become so popular that the US government made it a priority for the nation (Rattan et al., 2015:724) It must, nevertheless, be said that subsequent research has found flaws and inconsistencies in the studies carried out by Dweck (Sisk et al., 2018:569). Nevertheless, we may learn better if we tell ourselves we can (Moore and Shaughnessy, 2012:177).

1	I learn more if I can explain to someone else how I learnt it.	Coertjens, L. (2018: 138); Black, Swann, and William (2006:167) Haidar, A. H., & Al Naqabi, A. K. (2008) as cited by Ellis et al (2013:4019); Claxton (2005:77)
2	I learn more if I test myself along the way.	Kistner, S., Rakoczy, K., Otto, B., Dignath-van Ewijk, C., Buttner, G., & Kliem, E. (2010:157); Flavell, J.H. (1979:909); Claxton (2002:83)
3	I learn more if I tell myself I can do it.	Moore and Shaughnessy (2012:177)
4	I learn more if I track my scores.	Kistner, S., Rakoczy, K., Otto, B., Dignath-van Ewijk, C., Buttner, G., & Kliem, E. (2010:157); Flavell, J.H. (1979:909); Claxton (2002:83)
5	I learn more if I use a checklist or a mnemonic.	Ellis, Denton & Bond (2014)
6	I learn more if I try to predict what mark I will get.	Scharlach, T. (2008) as cited by Ellis et al (2013:4018)
7	I learn more if the teacher believes I can do better.	Dweck (2012:57)

Table 6: Survey Statements Evaluating Metacognitive Approaches

Ethical Considerations

The research was carried out with full regard to the BERA guidelines (2011). No research was undertaken without the initial and full consent of the Head teachers in both schools. In both the primary and the secondary school, the Head teacher was fully consulted and agreed to oversee the research. Due regard was given to the sensitivity of asking pupils how they think they learn (BERA 2011). There were no risks to participants and the principle of voluntarism was adhered to at all times. All responses were anonymous, and parents were consulted before

inviting pupils to participate using a letter in *appendix 20*. Every attempt was made to ensure that the survey was easy to complete and of the highest quality (Fogelman and Comber 2007:129).

Validity and Reliability

The terms 'reliability' and 'validity' are often positioned in a positivist framework (Bush, T. 2007:97: Ch6). Due to the nature of this study, it was difficult to demonstrate external validity, mainly due to the relatively small sample, although the sampling frame for the questionnaire included a total of more than 500 learners. From this, it was calculated that 92 responses would be needed to gain a 95% confidence level and a margin of error of 8.6%. In total, 109 replies were gathered which gave a 95% confidence level with a margin of error of 8.8%. The Cronbach's alpha reliability coefficient of the questionnaire items has been estimated with satisfactory values ($\alpha > 0.80$) (Taber, 2016:15).

The research findings focused on the concepts of credibility and transferability. This underlined the plausibility and its meaningfulness to the participants themselves (Shenton, 2004:64). The positivist, traditional concepts of validity and reliability in the research may, therefore, be replaced by the interpretivist “alternative concept of ‘trustworthiness’” (Bush, 2007:97) or indeed terms such as “credibility and authenticity” (Busher & James 2006:7). Thompson (2000:137), as cited by Mears (2012:174), stated that the “real aim” for the researcher “should be to reveal sources of bias rather than to pretend they can be nullified (...) by a distanced researcher without feeling”. The interviews exposed and reduced any such bias and added internal validity to the research as they focused on the conclusions drawn from the data (Cohen and Manion 1994:282). To assure validity, the questions were designed so that pupils did not know to which theory they referred, and responses were anonymous. Using the same evaluation survey questions to guide the interviews, reduced bias (Ribbins, 2007:210). The sampling was purposeful (Fogelman and Comber, 2007:135) to represent views from across the school from a balance of male and female pupils, and a balance of ethnicity and abilities. Awareness was shown of potential subjectivity of retrospective accounts. To increase the validity of the survey, statements were designed to provide a range of responses. In total, 14% of responses reflected the opinion that the learning strategy in question was “not important” and 32% of all responses reflected that the strategies in question were “very important”.

A Likert scale of 1-4 gave respondents the chance to express more subtle opinions and when all the ‘1’ and ‘2’ responses (as both reflecting ‘less important’) are added together, 37% of responses were in the ‘negative’ camp. All attempts were made to construct the survey without bias, but it was important to use the interview findings to elucidate why some respondents might have been more inclined to give negative responses than positive ones. To further increase validity, adults were invited to take part in the survey, to lend a contrasting perspective.

Research Findings

Responses to Learning Theories

Marginal gains across different strategies nudged the theories into a different order of preference for adults as opposed to young people (*Tables 7 & 8*). This created a visibly different learning taxonomy for each group, but Behaviourism was the least valued across both cohorts and Social & Emotional Learning fell into first place for both. For young people, each of the top six learning strategies out of 42, can be associated with one of the six different learning theories as shown in Table 10 below. This was different for the adults for whom the top six strategies came mainly from constructivist theories – see Table 11. Each strategy was also valued with more equanimity by young people than for the adults. The difference between the top six strategies for young learners is 0.38 but there was more variance amongst the adults with a difference of 1.8. This could, however, perhaps be explained by the different sample size (93 children and 17 adults). Findings also revealed differences between the Key Stages, indicating young people’s preferences change over time. Interviews explored the findings about individual strategies and added insight into how the taxonomies emerged.

Learning Theory Taxonomy	Mean Average across theories for adults.
17 Adult respondents aged 19-83	
SOCIAL & EMOTIONAL	3.18
COGNITIVISM	3.01
EXPERIENTIALISM	2.925
CONSTRUCTIVISM	2.906
METACOGNITION	2.612
BEHAVIOURISM	2.444

Table 7: Adult Learners. Learning Theories in order of preference

Learning Theory Taxonomy	Young People Mean Average
Year 6-13	
SOCIAL & EMOTIONAL	3.04
COGNITIVISM	2.945
METACOGNTION	2.811
EXPERIENTIALISM	2.805
CONSTRUCTIVISM	2.754
BEHAVIOURISM	2.69

Table 8: Young People (School pupils aged 10-18)

Learning Theory Taxonomy	All Learners
Adults and School Pupils	Mean Average
SOCIAL & EMOTIONAL	3.062
COGNITIVISM	2.953
EXPERIENTIALISM	2.837
METACOGNITION	2.791
CONSTRUCTIVISM	2.785
BEHAVIOURISM	2.668

Table 9: All respondents. (Adults and Young People)

1.1 Behaviourism

Behaviourist strategies were usually in the bottom third for all groups except for the powerful negative force of ‘fear of failure’, which was less important for adults than for younger learners. The fear of punishment, by contrast, was not popular. To explain this difference a boy in Year 8 commented:

Punishment doesn't change the way we learn but failing does.

One twelve-year-old pupil who was interviewed about why adults were less motivated by rewards than other groups noted:

I think adults would not think that rewards are important because they are able to achieve great things without them and the reward is basically learning in its own right.

Adults were the only group with the highest number of negative responses towards differentiation, showing that younger learners value this approach more and thought they learned better when the work was tailored for them. One recent school leaver who was interviewed said:

I am surprised that so many people said they wanted work tailored for them because as you go through school you get work that is not designed for you and you get used to it.

Another interviewee, aged 12, said:

I have changed my mind during this interview. At first, I thought, of course, I wanted work that matched my skills so I can move on but now I think it might make some people feel stupid if they have to do different work from me.

To test the ‘behaviourist’ approach of directional teaching, I asked respondents if they would prefer to find answers for themselves (in a constructivist style). During interviews one pupil said:

A good lesson gives us time to find things out for ourselves. I don't want the answer straight away.

One adult added:

Finding things out for yourself always feels better.

Finding out how to improve (as opposed to finding out the answers) came third overall with adults but came 40th with KS4 and 39th for KS5. One adult interviewed explained:

This is to do with the 'what' and the 'how'. People like finding things out for themselves but it's easier to find out facts than finding out how to improve your skills.

1.2 Cognitivism

Cognitive strategies seemed to grow in importance as the child developed across the Key Stages, reaching a high point for KS5 who learned best when the teacher breaks things down into small steps. On the matter of being 'asked questions to check for understanding', one Year 8 girl explained why this might not be as popular with younger groups:

It is kind of embarrassing to get told to answer in front of the whole class. It can help you to show the teacher your work, but some pupils might feel self-conscious about giving the wrong answer in front of the class.

Year 9 and year 8 pupils were slightly more positive about practising than answering questions although when asked why someone might *not* like to practise, one said:

Practising can be boring, and you can get the feeling that you're stuck.

The 'cognitivist' strategy of using stretch and challenge was tested by choosing the opposite wording ('keeping the lesson easy'). There were more negative responses than positive, confirming claims that the brain likes to be challenged (Briggs, 2015). The difference between pupils in Year 6 and Year 7 could reflect a dip in self-assurance in the latter group who had recently moved to secondary school. The confidence to try complexity grows back strongly by Year 12 and then recedes slightly again in adults. One Year 9 pupil explained why they did not want the lessons to be easy:

If the lesson is too easy, we won't be ready for our exams.

The cognitivist strategy of breaking things down into small steps was popular across all school pupils, declining only with adults. To explain, however, why a handful of pupils placed this as less important one boy in Year 8 said:

Some people don't want things broken down into small steps. They just want an overview and besides the exam won't be broken down into small steps.

To test the theory of cognitive load, I asked if respondents felt they learned best when they did not have to retain 'too much' information. Adults showed a positive response to retaining information, which perhaps reveals that adults might perceive learning as the same as 'remembering'. Young learners were more positive about reducing the amount of information they have to retain. One Year 8 child interviewed said:

There are too many school subjects and it could stop you from progressing if you had to remember everything all the time.

1.3 Constructivism

The most popular constructivist strategy was 'building on prior knowledge' and not particularly 'working with others' as one might have expected. Older teenagers were less confident than younger teenagers about working with a 'More Knowledgeable Other'. Interviews revealed some insight into this when a Sixth Former said:

Who wants to work with someone who always knows more than you?

'Catching up with older learners' was viewed as not important for over 70% of adults, which contrasted with all other groups. The younger pupils were keener to catch up with older learners, but this concept fell away sharply from year 9 onwards. One Year 8 girl explained:

We want amazing results like our older cousins or friends, but we might not be on the same path in life as them. It is not important to catch up. We even might be smarter than them anyway.

A young adult interviewed added:

It never crosses your mind that you are catching up with older learners especially at University, everyone is of different ages but if you are in year 6 you might think it is cool to catch up. As an adult, no one really cares. You just want to catch up with the knowledge, not the person.

The constructivist approach of teachers being more like 'guides' was tested with younger learners being keener than older ones who prefer more guidance and who were strongly negative about teachers merely 'standing by'. Also, half of all adult respondents felt they learn best if the teaching is more direct. When asked about this a thirteen-year-old pupil explained:

Some learners might not like this (teachers as guides) because it puts pressure on them in lessons, to work things out for themselves.

Equally a young adult explained:

The younger ones are more positive about teachers being a 'guide on the side' but this could be because the older learners realise the crucial importance of the teachers. For example, they realise that everyone usually learns little with a supply teacher.

Most constructivist strategies stayed near the lower end of the priority list, except for adults who found practising several times much more useful than younger children. Adults wanted more direct teaching and yet they were categorical about wanting to find out how to improve for themselves, compared to all other younger groups. When analysing the Likert responses, only Year 7-9 were more strongly negative about learning from homework that linked to the lesson. One young school leaver explained:

Some people put 'not important' to this because people don't do their homework. They also might have put it because homework is just extra and is not that important. If the homework was really that important you wouldn't leave it as homework where you know some kids are not going to do it. The kids know this so that's why they don't value it.

1.4 Experientialism

Experiential approaches remained in fourth or third place across the Key Stages, but adults said they learn better when they see a use for it. The most popular experientialist approach was 'choosing how to learn'. This was in the top six for Key Stages 2, 4 and 5 but adults placed this 34th. Claims about the advantages of being in a learning community (Wenger, 2010:02 and Ellis et al., 2013:4034), was tested by the statement: "I learn better if I see others learning around me". This was surprisingly low on the list of priorities for all groups. Having the freedom to choose how to learn something produced a uniform number of 'very important' votes across all ages but every year group had respondents for whom 'choosing the topic to study' is not important. One young adult being interviewed explained:

Maybe the adults are remembering school and think back to more structured lessons they used to have. Some didn't think it was important though because in year 8 and 9 it is about choosing your GCSEs, so you have no choice about what you do within each topic.

The Year 12 cohort gave exclusively positive results for this experiential approach, which contrasted with adults who put it in 34th place. When asked why adults might consider choosing how to learn as less important, one adult interviewee said:

Maybe the adults are negative because they were thinking of the children and don't think they will do the work if they could choose how to do it. This is the same reason why the younger ones want to choose – so they can mess around. Maybe it is also because they remember lessons from when they were younger, and they were never allowed to choose.

1.5 Metacognition

Nearly all the metacognitive strategies lost favour with adults except self-testing which was as low as 27th place at Key Stage 3. To explore why younger learners in years 8 & 9 were ambivalent one fourteen-year-old suggested:

The information might be fresh in your mind and you don't need to go over it. On the other hand, you might need more time to process it before you go for a test.

'Positive self-talk' never made it to the top ten and 'explaining how to do something to someone else' only really became popular at KS4. 'Predicting one's mark' never reached higher than 22nd place and was frequently trailing in a low position across all groups. Adults were the most negative. One young adult added insight:

Maybe older children know that predicting a test score is not necessarily related to predicting an overall grade, so they don't think it's useful.

Another successful GCSE candidate said that people don't necessarily like predicting their scores because, as she explained:

The sky is the limit.

'Tracking scores' stayed in the bottom half of all strategies (despite schools insisting on the use of tracker sheets at the front of school

books. A pupil in Year 12 explained its lack of popularity:

If you know what grade you're at, you don't need to look at your tracker sheet.

Using a checklist or mnemonic was never placed higher than the 20th position. This apparent negativity, was explained by one student:

Some people have a mental checklist. I started with a written checklist then over time I just knew what I needed to do. It's like training your brain to know what needs to be prioritised.

Having a teacher that 'believes in you' was only really important to KS2 and KS3 moving progressively down from 2nd place to 27th across the age groups. One Year 11 girl suggested a reason:

You want your grade for yourself. Who cares what anyone else thinks?

To conclude, it is interesting that each of the six learning theories were represented in each of the top six learning strategies. Notably, SEL, cognitive and constructivist approaches are in the top three. The least rated strategies have two metacognitive but no SEL approaches. The

‘behaviourist’ ‘fear of punishment’ was judged the least important and this contrasts with ‘fear of failure’, which was in the top six out of 42 strategies. Interviews revealed further insight when one pupil in year 8 said:

Punishing someone for not learning is stupid and comes from someone else. Failing is much worse and enough of a punishment for the learner.

1.6 Social & Emotional Learning Theory (SEL)

Social & Emotional strategies kept first place across all groups. Enjoying the lesson produced the most positive of all the results; there are no negative responses from year 10 upwards. Surprisingly, adults said they learn better, when they think the teacher likes them. This was less important for young people. To explain why there were so many ‘not important’ votes in all younger year groups, one sixth former said:

Students only care about grades and you’re going to move on whether your teacher likes you or not. Some pupils don’t associate learning with being liked and maybe their teachers are always grumpy, so they are not used to feeling ‘liked’.

Thinking ‘the teacher is good’ was less important for adults than for younger groups. They were more able to learn despite this. However, nearly 40% of respondents in Year 7 and some in every year group voted this as not important. A sixth former proposed:

Maybe they learn it anyway by going home and going over it. They might watch a YouTube teaching video or read up about it. They might just want credit for teaching it to themselves.

Focusing on mistakes was used to test conscientiousness, which is considered a personality quality that shows good self-management (Moritz-Saladino, 2017). This elicited entirely positive responses from KS4. One Year 12 student recalled how she achieved a top score in her GCSEs:

To get a top score at GCSE I had to look hard at my mistakes. It was unbearable at first and it takes you out of your comfort zone, but you will keep making mistakes if you don’t face them.

Adults were markedly different from younger year groups and placed focusing on mistakes as 32nd in importance. Adults and GCSE students were the most positive about double-checking but to explain why this had slipped in KS5, one student said:

Some people might not want to double-check their answers because they don’t know how to spot mistakes or because they don’t have time to put them right in any case, like in an exam.

Learners in Year 12 were unequivocal about the ‘SEL’ approach of learning from watching others. ‘Learning through discussion’ was popular with adults and Year 7. Year 9 respondents

were the least positive. Pupils in years 10 and 11 were not overwhelmingly positive either but the benefit of discussion picks up again in year 12. To explore the high number of ‘not important’ responses one student explained:

Maybe the concept does not require a discussion. Maybe they have social anxiety and feel too pressurised to perform during a discussion. It could distract them from what they are trying to learn. Maybe they had a bad experience of a ‘poor quality’ discussion.

The results showing the order of preference of individual strategies. This informed the construction of the Learning Theory Taxonomies in this paper are in tables 10 & 11 below. The theory behind each individual strategy is represented by the six different colours.

Survey Title: 'How do you think you learn?'	Mean	Std Deviation	Count
YOUNG LEARNERS ONLY Yr6-12. 93 Children.			
Please tell us if you only speak English at home.	1.32	0.47	93
I have my own computer at home and can always access the internet.	1.25	0.43	92
42 Strategies in order of Preference. Colour coding shows Learning Theory.			
I learn more if I am enjoying the lesson.	3.61	0.66	88
I learn more if the teacher breaks down what I need to know into short steps.	3.38	0.82	90
I learn better if I think the teacher is letting me choose how I learn it.	3.32	0.89	91
I learn more if the teacher believes I can do better.	3.3	0.88	91
I learn more if I am scared of failing.	3.25	0.65	92
I learn more if I build on what I already know.	3.24	0.79	91
I learn more if I think the teacher is good.	3.18	1.05	90
I learn more if I choose the topic to study.	3.15	0.99	91
I learn more when I am given a second go at something after thinking about how to improve.	3.11	0.88	89
I learn more if the teacher makes us practise something several times.	3.09	0.95	91
I learn more when we have class discussions.	3.08	0.88	90
I learn more if the teacher asks me questions to check if I have understood.	3.04	1	90
I learn more from watching someone show me how to do something.	3.04	0.9	91
I learn more if I focus on my mistakes.	3.03	0.99	91
I learn more if the work is specifically designed for me personally.	3	1.04	91
I learn more if I tell myself that I can do it.	2.98	0.97	91
I learn more if I test myself along the way.	2.94	1.06	90
I learn more if I find out the answers for myself.	2.89	0.97	90
I learn more when I double-check my answers.	2.89	0.95	91
I remember more if the teacher spaces out the learning.	2.87	0.92	91
I learn more if I can explain to someone else how I learnt it.	2.85	1.08	91
I learn more when I work with another pupil who knows more than me.	2.84	1.03	90
I learn more if the teacher acts more as a 'guide on the side'.	2.83	0.92	90
I learn more if I see a use for the learning.	2.8	1.11	91
I learn more if I revise the previous lesson before I start the next one.	2.79	1.11	89
I make more progress if I don't have to remember a lot of new information.	2.76	0.97	90
I learn more if I track my scores.	2.69	1.08	90
I learn more when my teacher 'drills' the information - for example chanting out the Times Table.	2.64	1	89
I learn more if I think I am catching up with older learners.	2.61	1.11	89
I learn more if I get a reward.	2.6	0.96	92
I learn better if I see others learning around me.	2.6	1.04	90
I learn more if I find out how to improve without being told.	2.59	0.95	91
I learn more from homework that links to the lesson.	2.58	1.05	91
I learn more if I try to predict what mark I will get.	2.54	1.07	90
I learn more if I think the teacher likes me.	2.53	1.24	91
I learn more if the lesson starts with some key questions.	2.52	1.01	89
I learn more working on my own.	2.48	1.05	91
I learn more if I use a checklist or a mnemonic.	2.48	1.07	90
I learn more from trying to teach other pupils, for example by giving a presentation.	2.47	1.2	91
I learn more if the lesson is easy.	2.38	1.13	91
I learn more if the classroom mimics a real world setting like using newspaper articles.	2.28	0.96	89
In general, I learn more when I am scared I might be punished in some way.	2.06	1.01	89

Table 10: Young Learners – all 42 strategies in order of preference

The colour-coding chart is shown below.

Colour Coding
BEHAVIOURISM
COGNITIVISM
CONSTRUCTIVISM
EXPERIENTIALISM
SOCIAL & EMOTIONAL
METACOGNITION

By contrast to Young People, the top six learning strategies for Adults – see *Table 11* below – came mainly from constructivist approaches, although Social & Emotional Learning Theory had the highest mean. Cognitive approaches have moved down the list of priorities for Adults and fear of failing has moved down to 20th place. Five out of seven metacognitive strategies were below 26th place for Adults whereas four were above 26th place for Young People.

	Learning Theory Preferences - Adults	Mean	Std Deviation
1	I learn more if I find out the answers for myself.	3.94	2.69
2	I learn more if I am enjoying the lesson.	3.71	0.46
3	I learn more if I find out how to improve without being told.	3.65	2.79
4	I learn more if the teacher makes us practise something several times.	3.41	0.69
5	I learn more if I build on what I already know.	3.35	0.68
6	I learn more if I test myself along the way.	3.29	0.46
7	I learn more if I see a use for the learning, for example speaking French in France or Spanish in Spain.	3.24	0.81
8	I learn more when I am given a second go at something after thinking about how to improve.	3.24	0.73
9	I learn more from watching someone show me how to do something.	3.18	0.71
10	I learn more when I double-check my answers.	3.18	0.71
11	I learn more if I can explain to someone else how I learnt it.	3.18	0.86
12	I learn more if the lesson starts with some key questions.	3.12	2.14
13	I learn more if the teacher asks me questions to check if I have understood.	3.12	0.96
14	I learn more if the teacher breaks down what I need to know into short steps.	3.12	0.83
15	I learn more if I choose the topic to study.	3.12	0.9
16	I learn more if I think the teacher is good.	3.12	0.9
17	I learn more when we have class discussions.	3.12	0.76
18	I learn more if I revise the previous lesson before I start the next one.	3.06	0.8
19	I learn more if I think the teacher likes me.	3.06	0.8
20	I learn more if I am scared of failing.	2.88	0.58
21	I remember more if the teacher spaces out the learning.	2.88	0.76
22	I learn more if the classroom mimics a real world setting like using newspaper articles.	2.88	0.93
23	I learn more from homework that links to the lesson.	2.82	0.78
24	I learn better if I see others learning around me.	2.82	0.86
25	I learn more when my teacher 'drills' the information - for example chanting out the Times Table.	2.76	2.31
26	I learn more if I tell myself that I can do it.	2.76	1.06
27	I learn more if the teacher believes I can do better.	2.76	0.94
28	I learn more from trying to teach other pupils, for example by giving a presentation.	2.71	1.07
29	I learn more working on my own.	2.65	0.97
30	I learn more when I work with another pupil who knows more than me.	2.63	1.05
31	I learn more if the teacher acts more as a guide on the side.	2.53	1.04
32	I learn more if I focus on my mistakes.	2.53	0.85
33	I learn more if I use a checklist or a mnemonic.	2.53	0.92
34	I learn better if I think the teacher is letting me choose how I learn it.	2.47	1.04
35	I learn more if the work is specifically designed for me personally.	2.41	1.03
36	I make more progress if I don't have to remember a lot of new information.	2.41	0.77
37	I learn more if the lesson is easy.	2.35	0.97
38	I learn more if I get a reward.	2.29	1.49
39	I learn more if I track my scores.	2.24	0.94
40	In general, I learn more when I am scared I might be punished in some way.	1.88	0.9
41	I learn more if I think I am catching up with older learners.	1.53	0.92
42	I learn more if I try to predict what mark I will get.	1.53	0.61

Table 11: Adults – all 42 Learning Strategies in order of preference.

The colour-coding chart is shown below.

Colour Coding
BEHAVIOURISM
COGNITIVISM
CONSTRUCTIVISM
EXPERIENTIALISM
SOCIAL & EMOTIONAL
METACOGNITION

2. Changing Preferences over time

2.1 Year 6.

When looking at other individual strategies, the twenty-one pupils in Year 6 placed the most importance on making the lesson enjoyable. ‘Fear of failure’ was placed seventh. This contrasts with the twentieth place for adults. Young children valued the ‘experientialist’ freedom to choose how to learn although they did not particularly need a use for the learning and placed it 38th. They also valued the ‘constructivist’ approach of building on prior knowledge and gave a higher priority to teachers acting as a ‘guide on the side’ than any other group. Meanwhile, ‘metacognitive’ mnemonics barely fare any better than the ‘behaviourist’ fear of punishment although positive self-talk and having a teacher who believes in them were placed much higher than other metacognitive approaches and contributed to Metacognition gaining second place overall in the Year 6 Learning Theory Taxonomy. This decreases in importance over time. As can be seen from Table 10, children in Year 6 gave a low importance to cognitive strategies, which contrasted significantly with Key Stage 3.

Learning Theory Taxonomy	Year 6 Mean Average
SOCIAL & EMOTIONAL	2.99
METACOGNITION	2.82
CONSTRUCTIVISM	2.75
EXPERIENTIALISM	2.745
COGNITIVISM	2.67
BEHAVIOURISM	2.66

Table 10: Learning Theory Taxonomy for Year 6

2.2 Key Stage 3

The pupils in Key Stage 3, valued more SEL approaches than the Year 6 pupils. Meanwhile, Cognitive approaches, which were in fifth place in Year 6, have moved to second place. Although ‘enjoyment’ still comes first, fear of failure has moved up to third place from seventh place. The Key Stage 3 pupils surveyed, preferred behaviourist’ directional teaching and *not* to find out answers for themselves.

Key Stage 3 pupils value working with pupils who know more than them and placed this strategy in 11th place, compared to Year 6 who placed it 33rd. Nevertheless, Constructivism overall fared less well than Metacognition, which held up due to the idea of positive self-talk and having a teacher who believes in them. Self-testing, tracking, predicting and using mnemonics are low down below 30th place out of 42.

Learning Theory Taxonomy Yr7-9	Key Stage 3 Mean Average
SOCIAL & EMOTIONAL	3.048
COGNITIVISM	2.972
EXPERIENTIALISM	2.817
METACOGNITION	2.784
BEHAVIOURISM	2.742
CONSTRUCTIVISM	2.738

Table 11. Learning Theory Taxonomy for Key Stage 3

2.3 Key Stage 4

Table 12 below clearly shows a shift in priorities for Key Stage 4 learners. Cognitive approaches have stayed ahead of Metacognition since Key Stage 3. Noticeably, the most popular metacognitive strategy in Year 6 was that of wanting to feel that their teacher believes in them but Key Stage 4 value explaining things to others. This has moved up from 25th place to 2nd place overall.

The top six strategies do not contain any experiential approaches or behavioural strategies. Key Stage 4 pupils fear failure less than younger pupils, despite the approaching public examinations. This has moved down to twelfth place for Key Stage 4, from third place at Key Stage 3.

Learning Theory Taxonomy Yr10-11	Key Stage 4 Mean Average
SOCIAL & EMOTIONAL	3.19
COGNITIVISM	3.13
METACOGNITION	3.095
EXPERIENTIALISM	2.9
CONSTRUCTIVISM	2.75
BEHAVIOURISM	2.55

Table 12: Learning Theory Taxonomy for Key Stage 4

2.4 Key Stage 5

For Key Stage 5 constructivist approaches gained popularity. However, SEL approaches still come first as shown in *Table 13*. Sixth formers valued ‘behaviourist’ rewards less than KS4. Although they valued more directional teaching, this did not lift the position of Behaviourism

within the taxonomy for Key Stage 5. Metacognition has dropped in popularity with Sixth formers prioritising telling themselves ‘they can do it’. This was in 15th place, up from 22nd place at Key Stage 4.

Learning Theory Taxonomy	Key Sage 5	Mean
SOCIAL & EMOTIONAL		3.06
COGNITIVISM		2.95
EXPERIENTIALISM		2.84
CONSTRUCTIVISM		2.82
METACOGNITION		2.79
BEHAVIOURISM		2.67

Table 13: Learning Taxonomy for Key Stage 5

3. Young People with English as an Additional Language.

There was a clear difference between respondents who only spoke English at home compared to those who spoke another language. Concerning behaviourist strategies, 56% of pupils with EAL were positive that getting a reward boosted learning, compared to 44% of those who only speak English at home. There was a very noticeable difference between pupils with EAL and those with English as a home language for ‘drilling’ information. 60% of pupils with EAL perceived this as very useful compared to only 39.5% of English speakers.

Concerning Cognitivist strategies, pupils with EAL were also less likely to want information broken down into short steps or to want the information to be spaced out. This was the largest difference with 64% of pupils with EAL being positive about this compared to 77% of pupils with English as a home language.

Pupils with EAL were more positive than English speakers towards Constructivist approaches. Pupils with EAL were more positive about building on what they already know and considerably more positive about catching up with older learners. 59% of pupils with EAL were positive about this idea than English speakers who were only 39.5% positive. The only constructivist strategy that was more popular with English only speakers was when the teacher acts as a ‘guide on the side’. This tallies with the preferences of pupils with EAL for behaviourist approaches.

As for Experientialist approaches, pupils with EAL were more positive about seeing a use for the learning. Over 70% of these pupils were positive about this compared to 53% of English speakers. Social and Emotional Learning Theory was equally or more popular with pupils with EAL but metacognitive strategies showed significant differences, as pupils with EAL were far more positive about explaining things to others; 71% valued this strategy as opposed to English only speaking pupils who were 58% positive. Meanwhile, learners with EAL were less likely to consider self-testing as valuable. Only 69% thought this was very important, as opposed to

81% of English only speakers. Both groups valued positive self-talk, and both were equally ambivalent about tracking scores. Pupils with EAL were more likely to value predicting scores. 53% of them thought that ‘predicting a score’ was very important, as opposed to 35% of ‘English only’ speakers.

Learning Theory Taxonomy	Children Yr6-12 who speak another language at home other than English. 62 respondents.	Mean Average across theories.
SOCIAL & EMOTIONAL		3.055
EXPERIENTIALISM		2.924
COGNITIVISM		2.916
METACOGNTIION		2.822
CONSTRUCTIVISM		2.821
BEHAVIOURISM		2.748

Table 14: Children who speak English as an additional language

The chart below shows a different order of preference for learning theories for those who only speak English at home, as shown in *Table 15* below.

Learning Theory Taxonomy	Children Yr6-12 who only speak English at home. 30 respondents.	Average Mean across theory for group.
SOCIAL & EMOTIONAL		3.042
COGNITIVISM		2.905
METACOGNITION		2.827
CONSTRUCTIVISM		2.667
BEHAVIOURISM		2.628
EXPERIENTIALISM		2.61

Table 15: Children who only speak English at home

Children who only speak English also preferred SEL and cognitive strategies but placed less importance on experiential approaches than children with EAL.

4. Young People who own a Computer

The taxonomy for the two groups is clearly different and the freedom to learn with a computer at home seemed to influence learner preferences considerably. Learners who own a computer were less positive about the value of rewards, less likely to learn better because of fear of failing and less likely to be motivated by fear of punishment. They were less likely to need work designed for them personally and less likely to value drilling. They were more likely to learn more by finding things out for themselves. This was a notable difference with only 45% of children without a computer, learning better through independent enquiry as opposed to 67% of learners with a computer.

Computer owners were less likely to want the lesson to be ‘easy’. Only 37% thought easiness was ‘very important’, as opposed to 54.5% of learners without a computer. Children without a computer were more likely to want to learn without having to remember a lot of information, although the difference was marginal compared to other strategies. This was similar for spacing.

Children without a computer were more likely to want to use the constructivist strategy of revising the previous lesson before starting the next one. 63% were positive compared to 50% of those who owned a computer and 27% of children without a computer felt they learnt better on their own, compared to 53% of children with a computer.

Children without a computer were also more likely to want to work with a pupil who knows more than them or a ‘MKO’. This suggests that Vygotsky’s social theory was perhaps more relevant before computers were invented: not owning a computer made children who took part in this research, more likely to want to catch up with older learners.

Children without a computer of their own were less likely to learn through experientialist strategies. 45% of children without a computer were positive about seeing a use, for example speaking French in France compared to 68% of children with a computer. The gap widens as 80% of children with a computer learn more when given a second go at something compared to only 59% of children without a computer. This was a significant finding, perhaps reflecting the nature of working on a computer and saving drafts, editing, researching information to make improvements and more.

Computer owners were more likely to learn from watching someone else do it: 79% of computer owners were positive about this compared to 68% of those without. One of the most significant differences was with the idea that one learns better if the lesson is enjoyable. 77% of children without a computer agreed that this was important compared to 92% of learners with a computer.

Learners with their own computers were more positive about double-checking their answers. They were also more positive about learning more if the teacher likes them and if the class has a discussion. There was also a very significant difference concerning self-testing. 50% of children without a computer were positive about this compared to 79% of children with a computer.

Learning Theory Taxonomy	Children with a computer. 60 respondents.	Average Mean across theory for group.
SOCIAL & EMOTIONAL		3.094
COGNITIVISM		2.935
EXPERIENTIALISM		2.862
METACOGNITION		2.835
CONSTRUCTIVISM		2.773
BEHAVIOURISM		2.696

Table 16: Young people who own a computer

Learning Theory Taxonomy	Children in Yr6-12 with no computer. 23 respondents.	Mean across theories for this cohort.
COGNITIVISM		2.96
SOCIAL & EMOTIONAL		2.92
METACOGNITION		2.79
BEHAVIOURISM		2.75
CONSTRUCTIVISM		2.72
EXPERIENTIALISM		2.69

Table 17: Children in Year 6 to 12, who do not have a computer

Children without a computer still represented 25% of all respondents across all the year groups 6 to 12 (aged 10-17). This is the first time we see cognitive approaches winning over SEL

Discussion

Different theories that were reviewed in the literature were all found to have a positive effect in this survey. However, proponents of Thorndike (1933:368), who claimed that pupils learn best using a combination of ‘carrot and stick’, might have been interested to see behavioural approaches were placed last in the list of six theories for both adults and young people. On the other hand, in defence of Thorndike, there were no personal computers in 1933 and children in my research who did not own a computer, gave a higher value to behavioural approaches than children who did own one. Also, the ‘carrot’ of rewards was not as popular as one might think with an average score of 2.6 out of 4. Fear of punishment was relegated to last place with an average of 2.06 and close to having little positive impact. ‘Fear of failure’ was shown however, to be a motivating force (Watson, 1926).

Young people, in this survey, vindicated the cognitivist claim that knowledge needs to be broken down into small steps (Case & Bereiter, 1984:142). Working with a pupil who knows more than me’ came 22nd and adults placed this 30th. Olusegun’s idea that constructivist teaching has “enormous” potential (2015:69) was not born out by findings from this survey as

learners placed this in 41st place. It was adults who placed it 22nd. The literature reviewed showed a dearth of direct canvassing of pupils and the results in this small-scale survey seem to point to the risk of excluding them when developing learning theories, as adults showed different preferences.

This research found that young people placed experientialism fourth out of six in the ‘learning taxonomy’ and in fact, it was the adults who placed a higher value upon this approach, placing it third. Nevertheless, one particular experiential strategy, that of having the freedom to choose how to learn something, was very important to young people and came third out of 42.

Claims that there is a strong correlation between metacognition and improved cognition (Coertjens, L., 2018:138) did not correlate completely with findings in this albeit small-scale research although young people did place it third out of sixth in importance. Adults placed it fifth. In this survey, Dweck’s work on ‘growth mindset’ (2012:57) was vindicated as young people placed a high value on having a teacher who believes they can do better. They placed this in fourth place whereas adults placed it 27th.

Social and Emotional learning was the big winner in this research, as young people and adults placed it in first place overall. Enjoying the lesson was the most important thing for all.

Limitations and Suggestions for Further Study

In the introduction, I refer to the importance of considering pupils’ views, but I am mindful that these may not always be completely valid and may rely more on ‘student-teacher fit’ (Feistauer & Richter, 2017:1236). The survey outcomes, in this case, are also subject to the limitations imposed by the Likert scales chosen which I limited to seven per theory. The learning theories discussed were not revealed to the respondents to reduce subjectivity, but this could have meant statements were open to wider interpretation. The research findings were also limited by the variations in cohort sizes per year group and slightly biased towards the researchers’ main school (59 out of 109 respondents).

Future longitudinal studies could link pupils’ views on how they think they learn with academic outcomes. The transferability of this research could be tested, by completing the survey with other cohorts to include other contextual factors, other than home language or owning a computer, such as gender. The research explores 42 strategies, but others could be tested as well as other theories. All learners thought they learned better if they enjoy the lesson so finding out precisely what they enjoy needs to be the subject of further research. This research found that fear is indeed a factor in learning; not fear of external sanctions but fear of failure. Most learners admitted to being motivated by this therefore it may well be worth revisiting how young people define failure so we can best help them to avoid it.

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