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**Many Voices - One Message:
A Cross-Cultural Study of Student Learning
Processes with Implications for Learners,
Teachers and Reformers**

Will the Real Learner Raise a Hand?

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Abstract

The study of pupil learning preferences which this paper reports and discusses clearly raises issues which should be of concern to all professional educators. Data were generated from pupils using the Learning Combination Inventory and from essays written by their teachers. Principally the study provides a picture of pupil learning which is not entirely congruent with much that constitutes current primary practice. Essentially pupils are shown to have individual combinations or profile of preferences for learning. A range of examples of the learning combinations of individual children is used to discuss the implications for improving the effectiveness of practice in teaching and learning.

Introduction

In order to illuminate the individuality of learners, this study focuses on children's preferences for learning and on the specific combinations which characterise individual learners. The study is based on data generated by the Learning Combination Inventory (LCI) devised by Johnston et al (Johnston, 1995). The LCI uses the analogy of turning the tumblers in unlocking a combination safe to illustrate how children's preferences for learning may include distinct patterns or schemas which influence learning style and the opportunity to learn. The LCI identifies four learning schemas which are referred to as sequential processing, precise processing, technical processing and confluent processing. Generally speaking, a sequential processor is an individual who prefers clear and explicit directions/instructions in approaching learning tasks. Sequential processors need to be organised, to work neatly and methodically and to have the time necessary to complete tasks to their satisfaction. A precise processor's predilection is for gathering, processing and utilising lots of data, and this gives rise to the asking and answering of many questions and to a preference for demonstrating learning through the writing of answers and factual reports. A technical processor on the other hand is

much less comfortable with writing, preferring hands-on experience with relevant materials and problem-solving tasks to which his or her own solution-forming strategies can be distinguished and applied. Technical processors tend to be challenged, independent and often private thinkers. Confluent processors are similarly creative and imaginative, have a strong preference for seeing 'the bigger picture' and enjoy finding and making the widest connections between ideas or phenomena.

While an individual learner may have a strong preference for one or more of the four schemas, or may access them on an 'as-needed' basis (or indeed not at all), it is the individual learner's particular combination of preferences which expresses the individuality of the learner and influences his or her approaches to and arguably, success in learning. The premise of this paper is that it is only through an awareness and understanding of these preference combinations on the part of both teacher and learner that the most successful learning is likely to be facilitated.

While the mission statements and policy documents of schools generally, reflect a view of education as an open-ended, dynamic and life-long process and pledge commitment to an eclectic approach to teaching and learning which takes account of individual needs, the fact is that practice sometimes falls short of such ideals. Indeed, according to Gammage (1986, p 82) the reality is often shown to be one of modestly child-centred and individual approaches, mixed with a large core of class teaching and recognisably planned and sequenced teacher direction. The problem may be that practice may be governed by an implicit assumption that children all learn in much the same ways. The danger of course, is that this may precipitate practice which fails to tap the true potential of children as individual learners.

It may also be the case that a restricted conception of learning in which priority is placed on facts, knowledge and information (Whitaker, 1988, p 33) and which most values linguistic and logical mathematical ability, has perhaps been unduly influential on practice in teaching and learning. To the extent to which this is the case, schools may (inadvertently or otherwise) value the sequential processor and precise processor approaches to learning more than others. In turn this may precipitate a knowledge-driven curriculum and teaching which treats learning as something that is done to children rather than by children and which is most facilitative therefore, of pupils who are ready to receive learning as opposed to actively engage in it. The implications of this approach to schooling are that it can discriminate against and demoralise children who do not learn best in this fashion. The concern here as Hutchcroft (1983, p 36) notes, is that children need to have opportunities for learning in ways that are appropriate for them as individuals. Given the insights afforded by theories of multiple-intelligences (Gardner, 1983) and the dynamic and interactive model of Learning which the LCI enshrines, the potential exists for primary practice to be transformed so that the quality of teaching and learning more adequately meets the needs of individual children.

Editor's Note: This paper has been edited for brevity. For a copy of the entire text including a discussion of Methodology and Data Analysis, please contact the author directly. What follows is a discussion of the study's outcomes.

Specific Learning Combinations

Taken together, the findings suggest that within individual classrooms there may be

children who have quite individualistic learning preference combinations or profiles. This is substantiated by the reflections of teachers, one of whom said:

There was an extremely high level of congruence between my professional perceptions of my pupils as learners and what the study revealed about them. Not only did this give the results a greater sense of authenticity (revealing that the pupils had understood the task and answered honestly) but it also highlighted the value of the study in being able to provide significant insights into individual pupil learning preferences.

It is therefore to specific learning preference profiles that this paper now turns. The focus in the selection of profiles is on individual children who have very strong preferences for and against particular schemas.

Joan - precise processor (PP Use first; Avoid SP, TP and CP)

Joan's LCI results show her to have a distinct preference for precise processing approaches to learning at the expense of other schemas. She is described by her teacher as a capable self-sufficient responsible and serious child, and this would seem to be consistent with what Joan herself writes - 'I would have children learn by doing fun things, but I would make sure they didn't have too much fun'. This reflects the sober side of the precise processor. Joan takes great pride in her work, preferring to work neatly and methodically. She says, 'When I can't do something, I keep trying till I get it right'. Joan's frustrations as a learner include 'not getting enough information, not knowing enough details, teachers who don't give clear, coherent and detailed instructions and directions'.

William - Use First SP, TP and CP; Avoid PP

William's dislike of detail and specific notes is consistent with his comment that he would teach history by 'going to Viking places' and he would learn maths 'with shells'. A child of above average ability, he often loses concentration when tasks require precise processing. William does not invest in memorising information in detail since he regards the specificity of information as unimportant. He adds: 'I hate the way a task runs on for about four days in a row; I get tired of it'.

Gemma - SP Use first; Avoid PP, SP and CP

Gemma responses to the LCI show her to be an out and out sequential processor (totalling 35 in that particular category) . Gemma says of herself: 'When I don't know what to write, I make a big long mistake'. Her teacher referred to Gemma's almost pathological concern for neatness, teacher direction and planning as inhibiting and preventing her broader learning development. Gemma's inhibitions as a learner are evident in activities which are not so heavily teacher-directed such as art and design and problem-solving through investigations. Gemma works best when she knows what is expected of her and the rules of engagement are explicit.

Gemma is the youngest of five children in her family. She is of below average height and weight and has been treated as the 'baby' in her home environment. Her teacher noted that, 'she has had little experience of independent work and needs continual

detailed explanations, reinforcement and praise before she can do her work in school'. This is substantiated by Gemma's response in section 2 of the LCI where she said that she would show the teacher how to do something by 'explaining it well to show I understand and write a little on it. Similarly, she sees a teacher's role as being "to read a lot more and explain it well to pupils.'

Jim, Claire - PP and SP Use first; Avoid TP and CP

Jim is a child who is extremely anxious to do well and who loves the security he finds in repetitive exercises which he voraciously completes. Although he generally achieves success in tasks ('When I can't do something I keep trying till I get it right'), open-ended investigations or technical tasks clearly cause him stress. In the latter, he continually asks for reassurance, and where possible will avoid them since he feels threatened by them. His teacher believes that, 'Jim's preference for precise processing and sequential processing has distorted his learning schema combination and consequently he needs to be helped with structured experiences of other types so that he regains confidence and redresses the balance'. His comment, 'Interruptions get on my nerves,' helps explain his difficulty in working with others in group contexts who do not share his exacting attitude. While working with others of a similar style might avoid this frustration, equally it would benefit his social development to learn to work with others of a different combination of learning style preferences.

Claire's class teacher described her as being very methodical in her approach, and this is substantiated by Claire's comment that she found work frustrating because of 'too much work, nervousness, other people asking me spellings and making me forget my answers, the teacher changing the way she wants you to do work'. Her teacher describes her as, 'a child who in class, invariably appears to be on the outside, looking in. She seldom becomes enthusiastic about taking part in discussions or practical activities and prefers to engage in what she sees as 'safe' reading and writing activities'.

Paul - TP Use first; Avoid SP, PP and CP

Paul is described by his teacher as a quiet, shy, unassuming boy. A boy of few words, he has difficulty in expressing his thoughts, feelings and intentions. He rarely contributes to discussions unless he is specifically spoken to, and then he blushes profusely and answers mainly in monosyllabic terms. He is very neat in class work but his teacher noted that he may be insecure since he seems to want to cover up his work if she comes close to him. He exudes a strong preference for mathematics and science as subjects in school. He likes science because 'you can take things apart and put them together again to find out how they work; if you know how it works, then it helps you understand what it can and cannot do.' In relation to English, he dislikes the fact that there are so many rules to learn, and gives as an example the many different aspects of punctuation. Paul prefers practical methods of expression ('I do enjoy reading and looking for things but I don't like writing about it and the length of time that takes'.) Paul writes, 'I get frustrated when I have to wait a long time to get things started'. He tolerates homework because it mainly takes the form of pencil and paper tasks and involves the provision of answers which are either right or wrong. Drawing and modelling activities actively engage him and are found by him to be intrinsically rewarding, whereas writing offers him extrinsic reward at best and perhaps failure at worst. He writes, 'I prefer to go out on trips rather than just learning from books and videos about the places we could visit'.

Paul's teacher added that ,it is technical processors such as Paul who most frustrate me through their need to take everything apart. It often seems as if they are simply intent on making a dreadful mess'.

Natasha - Use first SP, PP, CP; Avoid TP

Her teacher says, 'in written English Natasha is creative as well as concise and always gets to the point. She is an excellent mathematician and in science displays a marvellous understanding. She has a very high level of planning, investigating, recording and problem-solving skills. She is capable of carrying out investigations both independently and in group situations. In the latter she exudes leadership skills and qualities'. This confirms that Natasha displays an individualistic learning style combination in the sense that she marries the ability and need to see interrelatedness with a propensity for inquiry and a thorough and careful approach.

Stephen - Use first CP; Avoid SP, PP and TP

Stephen is a quiet child who has his own unique way of expressing himself orally and in written form using a very elaborate vocabulary. An avid reader, Stephen has an excellent general knowledge and is particularly interested in music and nature. He pursues these interests both in and out of school. He also enjoys gardening and experimenting to try to invent or discover ways of improving his crops. Stephen expresses frustration about having to read 'easy' books with the others in the class and concern that children are rarely taught how to survive in a crisis. He feels learning would be more relevant if it equipped children with first aid skills.

His teacher described Stephen as academically very capable in all curricular areas but something of an enigma as a pupil. He has 'refreshing ways of seeing things and good imagination'. She said, 'children like Stephen stand out (sometimes in a positive way and sometimes in a negative way) in class and in school, by having refreshing ways of seeing things and a vivid imagination.'. The teacher added that which it was could depend on the perspective of the person determining positive and negative, and could possibly relate to that person's own preference for or against confluent processing.

As a confluent processor, Stephen runs the risk of being misunderstood. He makes connections to an extent which may be overlooked by those who do not make or need to find such connections. He dislikes the constraints of rules and formalities and prefers to have the freedom to explore. He needs to express himself through working on open-ended tasks and through problem-solving activity. In making the connections he needs to make, he may frustrate others because of the number of apparently irrelevant questions he generates. Misunderstanding may occur if the teacher interprets such behaviour as a control problem. Rather than facilitating the development of learning for the individual, the teacher may introduce further constraints, formalise the teaching more, and as a consequence, stifle the learner and defeat the purpose of the lesson. A teacher who doesn't properly interpret the behaviour of confluent processors such as Stephen, may resort to safe' teaching strategies that prevent or inhibit risk-taking and adventure.

Additionally, confluent processors such as Stephen may be frustrated by the outworking of the legislated NI Curriculum and the Transfer Selection system. A narrowness of focus may creep into classroom teaching which could result in practice which is primarily focused on transmission of knowledge and measurement of it. This

could involve a preoccupation with coverage of a core of subjects and the acquisition of factual knowledge which is likely to emphasise precise processing as a learning schema.

Glenda - Use first SP, PP, TP; Avoid CP

Glenda's teacher observed that in school she has not been allowed enough freedom to explore but rather has been made to follow tight rules for the performance of tasks. Subsequent to the study, the teacher reports that opportunities are now being presented to help Glenda develop as a confluent processor. Early results are that in creative writing classes she has more freedom to select a preferred writing style and this has produced short plays while others choose to write poetry.

Christopher - Use first TP and CP; Avoid SP and PP

Christopher uses technical and confluent schemas first and uses sequential and precise approaches only under duress. As to what makes assignments frustrating for him, Christopher replied, 'When I know what to do and other people don't, and I have to wait until the teacher explains enough times for them to know how to do it'. He 'likes to be free to explore and experiment', and is 'easily bored by written activities'. He would prefer to 'talk to the teacher' or 'to discuss information with her', so that she 'would know whether he understood a topic'. His teacher's comments are most illuminating:

Christopher has been the pupil who since September, has most stood out. When Christopher returned to school after the summer holidays, he made no secret of the fact that he did not want to be there and he continued to exhibit behaviour consistent with this throughout the term. Although a pupil of well above average ability, his work and presentation of it was atrocious. Last term was a constant struggle in which I was constantly deciding whether to pressurise him or to leave him to his own devices, since little or nothing seemed to motivate him. The only times he showed any enthusiasm were during practical science experiments, PE and using the CD ROM on the computer. In January I brought the class on a residential visit to an outdoor pursuits centre. I was astounded to see the normally lethargic Christopher become an active participant in all activities and follow-up discussions. He came alive! He returned home an expert on the Mourne Mountains. I cashed in on his new-found enthusiasm by having him produce an excellent newspaper detailing the events of the field-study trip. My only regret is that I did not have the LCI study information last September. It would have helped prevent me having the persistent and exhausting battle to motivate him. Indeed I had concluded that he was a bit of a rebel and that he had and was, a discipline problem. Subsequent to the LCI study, I'm more inclined to see him as a free spirit trapped within a highly structured educational system. I have introduced more problem-solving activities and a greater degree of personal choice in my classroom activity. Interestingly, Christopher has chosen to complete a project on Ephesus which he visited on holiday last summer. Christopher and I have now come to an understanding and have formed a very good pupil/teacher relationship as I have come to realise why we went through all those months of misery.

Discussion

Primary schools typically claim that they aim to be environments where the uniqueness and individuality of children's learning will be enriched, valued and developed. Schools also aim to be places where children want to come, places in which their sense of inquiry and curiosity is stirred and fuelled and where they have the opportunity to access the full range of experiences in maximising their learning. The pressure on many teachers however, is that the National Curriculum, parents and possibly also principals and professional colleagues understand 'pupil progress' primarily or only in terms of factual knowledge transmitted and evaluate learning as improvements in the indices yielded by pencil and paper tests. As a consequence, practice can easily become narrow and restrictive, with teaching to the test the primary strategy for teaching and learning.

The findings of this study highlight what has long been recognised but perhaps inadequately understood or reflected in teaching and learning, about the individuality of children as learners. As Sotto (1994, p 109) says:

to teach in a way which takes account of the way people learn, requires systematic study of how they learn, followed by a great many struggles to translate such study into effective teaching practice.

Above all else, the findings are that children like to learn in a variety of ways. Using the data generated by the LCI, teachers can begin to identify a child's individual learning profile and so can more effectively match each child to an appropriate learning task. If stimulated and challenged by a task with which they feel comfortable, the 'will to learn' may not only be unlocked but also extended so that children are more motivated to learn and arguably, as a consequence, be less likely to underachieve.

The existence of specific combinations of preferences for learning reported and illuminated above, points to the need for these to be recognised and understood by both teacher and learner. That this can take place is illustrated by one teacher who reflected:

When I discussed the results of the study with the children, I found their reactions very interesting. They were enthusiastic in their engagement when it came to identifying and talking about their individual learning combinations. As I drew out some of the characteristics of each schema, some children spoke not just of their own characteristics, but extended to naming others in the class whom they believed to have these characteristics.

There is an appropriate note of caution in the words of another teacher:

It is imperative that I do not fall into the trap of concluding that because many of my pupils are shown to prefer sequential processing, I should confine or tailor my teaching to this style. Rather, I must take this into account and try to encourage my learners to be as comfortable as possible with their existing preferences and to be open-minded in their disposition towards, and appropriate recourse to, a richer cocktail of learning style preferences.

In being aware of the mosaic of learning combinations among learners in her class, this teacher has the basis for understanding the pupil's individuality and for meeting the pupil's individual needs both through acknowledging the preferences which exist and through encouraging and seeking to develop learners' less preferred schemas.

Additionally, the evidence from the study suggests that children's individual learning combinations may be such that they operate to restrict or constrain learning. Where this is the case, there is every reason to suggest the necessity for teacher/learner dialogue aimed at intervention designed to 'extend the will to learn' by helping the learner acquire a more eclectic combination of preferences for learning.

That teachers effect learning through the environments they create and the models of learning they present and value is illustrated by the reflections of one class teacher:

While in broad terms the data from my sample confirmed the overall findings, a significantly higher percentage of girls in my school sample were Technical Processors than was the case in the overall sample. One possible explanation for this might focus on my teaching style which tends to place an emphasis on practical activities and an investigational approach to learning.

Whilst this may be viewed as speculative, it is nevertheless reasonable to argue that children quickly learn to interpret what their teacher's preferences are and try to please by operating in the valued schema, perhaps at the expense of the preferences they themselves hold. If this is indeed the case, teachers must have awareness of their own learning preferences and how these may be active in influencing the learning preferences of their pupils.

As one teacher said:

This study has opened up a whole range of issues for me to think seriously about. Whatever else the LCI does, it has reinforced for me that learning involves cognition, conation and affectation and cannot be conceived merely as cognitive development. The teacher can not impose his or her preferences in terms of learning style on pupils. Rather pupils must have the opportunity to develop learning style unfettered by such restriction. If this is to happen, schools and teachers must re-evaluate the appropriateness of their aims and objectives as well as their teaching methodologies.

Another further illustrated the point:

Awareness of children's learning styles can help me to consider whether or not I tend to over-emphasise practical hands-on activities in my classroom. While I personally value such experiences highly as ways of consolidating concepts, they may not always be most suited to the individual learners in my care.

It would thus appear to be imperative that approaches to teaching must be pedagogically eclectic in terms of both strategy and organisation. For example, if children who are predominantly precise or sequential processors are to develop as confluent processors and technical processors, teachers may have to consider being less directive of children as learners. Additionally, there may need to be a review of classroom organisation for teaching and learning including for example, the constitution of pupil groupings for various learning tasks. In some instances it may be most appropriate that group members have a relative homogeneity of learning combination preferences, whereas in other contexts the grouping of children to include heterogeneity of learning preferences may provide for a richer quality of learning experience. Clearly the extent to which this requires particular teachers to 'reconstruct' themselves as practitioners creates implications in terms of staff training and development. For those willing to embrace a new role and new skills however, there is opportunity for greater professional satisfaction through enhanced pupil learning.

Conclusion

By highlighting that children may learn in ways which are at variance with what was previously thought and by indicating the factors which may influence pupil learning, this study raises a number of issues which relate to the practice of primary education.

While practice in the primary classroom is inevitably conditioned by what is feasible within a prescribed national curriculum and the concomitant national assessment procedures, it must not lose sight of the need to develop each child's potential. Opportunities must be available for all children to use their preferred learning style in rewarding, appropriate tasks. However, children must also be helped to become more eclectic and to use a variety of learning styles so that they do not become unduly schema-specific.

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