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Learning, Performance and Improvement

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Learning, Performance and Improvement

Purposes:

This paper considers the relation between learning in schools and performance in schools, and then goes on to examine evidence on ways in which performance in school may be enhanced and improved through learning about learning. The review of evidence is based on a reading of more than 100 classroom-based research studies and a wider literature base, not all of which is cited for reasons of space.

The evidence leads to the conclusion that learning about learning is a practically viable and educationally important strategy which also has the effect of improving performance. But learning-centred school improvement is less prevalent than might be envisaged from this evidence, because it remains in tension with the dominant discourse about classroom learning and with current policy interventions in England.

In understanding any relationship between learning and performance it is first necessary to review each of these terms and their range of meanings.

Background and Context 1: Views of Learning

The term "learning" is given a range of meanings. In everyday talk, media and television it is rarely used: when it is, it usually implies "being taught".

In the world of education "learning" may be used a lot, but on closer inspection the term can be standing in for distinctly different processes such as teaching, producing, performing according to certain criteria, and so on. And in classrooms it is rarely heard.

In research, a review of developments across the 20th century highlighted that learning is now seen as change in knowledge, occurring through a process of knowledge construction in which the social context of learning is important[1]. Learner differences and contextual differences are both shown to be influential. Studies of the social context of learning have helped us see that understanding is a shared phenomenon, that learning may usefully be seen as joining a knowledge community, and that much learning remains very specific to the social situation in which it was originally learned[2].

In every school and every classroom, views of learning are present, even if they remain implicit. The long-standing culture of classrooms is: teaching is telling, learning is listening, knowledge is subject matter taught by teachers and found in books[3]. This does not accord with evidence from research. But it will inhabit classroom life unless there is clear action to counter it. And there is important research showing that classrooms can create a better view.

In the meanings held by learners themselves, views of learning have become a key focus of research. Studies of adult students have identified a range of views of learning:

- increasing one's knowledge
- memorising and reproducing
- applying, general rules to particulars
- understanding, making sense
- seeing something in a different way
- changing as a person[4].

Such conceptions of learning are important since they have a great influence on how people go about their learning. School-age learners may have simpler conceptions than adult students, but they still range in a similar way from *thin* conceptions to *rich* conceptions of learning.

Effective learners are likely to have a rich conception of learning, along with strengths in what researchers have identified as metacognition, self-monitoring and self-regulation.

Background and Context 2: Views of Performance in School

School systems are viewed in different ways at different times and in different contexts. They may be viewed in terms of the personal-social development of pupils, in terms of examination results, in terms of civic contribution and many more. In England and elsewhere, a particular view of school performance has been dominant in recent years, as a result of government focus on performance tests for pupils, performance tables for schools, performance management for teachers and so on. Performance in timed paper-and-pencil tests lies at one end of a spectrum of meanings for the term: at the other end, the term performance also describes richer authentic achievements such as collaborative endeavours of a long-term nature with important audiences and impact in mind. Some state education systems emphasise these[5].

Timed paper-and-pencil tests are shown to be unreliable for the gradings derived from them[6]. The school "league tables" they create are shown to be unfit for the purpose claimed for them[7]. Managing teachers on the basis of such performance has lowered teacher morale and led to some leaving the profession[8]. Most recently school performance tables were officially recognized as a form of sanction and reward, but "we found no quantified evidence of the effect of sanctions and rewards on levels of performance"[9]. There are now 22 different categories of use to which the results of paper-and-pencil test are put[10], all unfit for purpose.

With such a view of school performance, recently described as "hyperaccountability"[11], schools are subjected to increased pressures and faced with increased tensions. In general the response has been to narrow the curriculum, and teach to the test, with the associated reduction in pupil motivation and enjoyment[12].

Those who emphasise performance often take particular views on how performance is to be improved, and also display their view of learning. As one Chief Inspector of Schools put it: "How does one learn as a human being except through pressure and threat?"[13]. When pressure is applied to complex human systems such as school, two things seem to happen: first, pressure is usually passed on down the hierarchical levels, second, the operation of classrooms reverts to earlier more teacher-directed forms.

In recent years Government in England (but not Wales, Scotland, …) has directed schools in an instruction-focused way, and reinforced a model of learning as being taught. This approach contrasts markedly with a learning paradigm[14]. Despite its claims for "whole class interactive teaching", independent research shows an increase in whole-class teaching, including an increase in the amount of talking *at* pupils through statements and not in talking *with* pupils by asking questions[15].

As the major truly independent review of primary education put it, schools in England have been subjected to a "state theory of learning"[16].

So does this focus on a narrow view of performance and the associated pressure to achieve results even prove successful in its own terms and actually lead to increased performance? At the largest level, international surveys offer evidence:

> "Pressure for reading achievement correlated negatively with reading engagement and with reading achievement in a majority of countries"[17]
>
> "'Achievement press' which was measured by students' perceptions of the extent to which teachers emphasise academic performance and place high demands on students, is only moderately related to performance, and the effect on performance, on average across OECD countries, on the mathematical and scientific literacy scales is not statistically significant"[18]

To understand matters better, we need to focus on the level which school effectiveness research has shown us is influential: the classroom.

A crucial classroom experiment

It is very rare in educational research to find an experimental study, not in a laboratory setting, but in the natural circumstances of real classrooms. This study matched all the requirements of "hard science", and appeared in an empirical journal which rarely carries studies from education[19].

Fifteen teachers were randomly assigned to one of two conditions: in the first group teachers were told their job was to help the pupils learn, the second group were told that their job was to ensure children perform well. Then in their own classrooms they were asked to help their 10 year-old classes solve two sorts of problems. They were videotaped, and the tapes were analysed by coders who did not know which condition the teachers were in. Pupils were asked to complete some other similar tasks by an experimenter who was also blind to the condition which teachers had been allocated to. Student performance on the tasks taught and on a generalization task was assessed by independent judges. Results showed that the students did less well on the subsequent test when they were exposed to pressured teachers using controlling strategies as a result of the performance instruction.

So performance pressure does not help increase performance. How may this be understood further?

The Key Issue: A Learner's Orientation

In studies of motivation, development and achievement, by many research teams across a number of decades and many countries, a recurring distinction arises. Any learner can, in a given context, adopt an orientation which can be described on the dimension below:

Learning Orientation	*Performance Orientation*
A dimension along which we all vary as learners	
we believe that effort can lead to success	we believe that ability leads to success
we believe in our ability to improve and learn, and not be fixed or stuck	we are concerned to be seen as able, and to perform well in others' eyes
we prefer challenging tasks, whose outcome reflects our approach	we seek satisfaction from doing better than others
we get satisfaction from personally-defined success at difficult tasks	we emphasise competition, public evaluation
we talk to ourselves: when engaged in a task we talk ourselves through	when the task is difficult we display helplessness: *"I can't do X"*
A concern for ***improving*** *one's competence*	*A concern for* ***proving*** *one's competence*

Orientations in school may be measured by questionnaire which asks respondents to show their general (dis)agreement with the twelve items below (derived from the most valid of a number of instruments[20]). Each orientation is assessed by six of the items:

1 I like school work that I'll learn from, even if I make a lot of mistakes.
2 I would feel really good if I were the only one who could answer the teachers' questions in class.
3 An important reason why I do my school work is because I like to learn new things.
4 It's very important to me that I don't look stupid in my classes.
5 I like school work best when it really makes me think.
6 It's important to me that the other students in my classes think that I am good at my work.
7 An important reason why I do my work in school is because I want to get better at it.
8 An important reason I do my school work is so that I don't embarrass myself.
9 I do my school work because I'm interested in it.
10 I want to do better than other students in my classes.
11 An important reason I do my school work is because I enjoy it.
12 The reason I do my work is so others won't think I'm dumb.

This instrument makes the point that the orientations are not polar opposites: someone can score high or low on *both* of the dimensions which the questionnaire measures.

Learners' orientations and achievement

Various studies have shown the connectedness between the elements of learning orientation listed above: individuals who scored high on a learning orientation select and use deep learning strategies which leads them to assume responsibility with high levels of persistence[21], they use more strategies, and possess more metacognitive knowledge about their learning[22]. They also use better self-motivating strategies[23].

These studies, and others, also show that:

- those with a learning orientation obtain higher achievement scores even when prior achievement is controlled statistically.
- *learning orientation helps to increase academic achievement independent of one's performance orientation.*

In everyday terms this means that the motivation to prove one's competence is immaterial without the motivation to improve one's competence[24]. This refutes the idea that a focus on learning and a focus on performance are in some way alternatives.

So a focus on learning can enhance performance, whereas a focus on performance (alone) can depress performance. The effects of performance orientation include greater helplessness, reduced help-seeking, less strategy use, more maladaptive strategies (i.e. strategies which are not proving effective), and a greater focus on grade feedback.

Some researchers have questioned the effects of performance orientation on achievement and have chosen to separate 'performance approach' from 'performance avoid', with the second having obviously negative effects. However even if someone is motivated to prove their competence (performance approach) the evidence above demonstrates that they will not be able to achieve this without an orientation to **im**prove their competence[25]. In high school, learning orientation is significantly correlated with grades, whereas performance approach is not[26].

High performance in other domains

Discussion of performance in school is often punctuated by comments about how performance is achieved in other domains, so it may be important to look at evidence in such domains.

In sport, elite athletes with a learning orientation focus on incremental improvement and mastering a task: this not only predicts their achievement, but also enjoyment and staying power[27]. Athletes with a performance orientation are less able to handle non-successful experiences. So the popular view that winners succeed because they are "hungry for gold" is erroneous.

In business it has been shown that salespeople's effectiveness is associated with a learning orientation[28]. So success in a competitive context is not defined by a competitive attitude but a learning attitude. In an interactive business simulation participants were asked to make a series of complex decisions to increase market share. Performance was highest for individuals with a high learning goal, who also developed greater conviction of their ability to master the task, and a higher commitment to their goal[29].

Effective teams also have a learning orientation which helps them view mistakes as a resource rather than a problem: at first sight they appear to make *more* mistakes; on closer inspection they don't *make* more mistakes, they *report* more[30].

Although the practice of setting goals is common, the setting of performance goals can be counter-productive whereas setting learning goals can be effective. Giving trainee Air Traffic Controllers a specific challenging performance goal with regard to the number of planes to be landed decreased rather than increased their effectiveness[31]. A recent review on the effects of goal-setting concluded: "Goals may cause systematic problems in organizations due to narrowed focus, unethical behaviour, increased risk-taking, decreased cooperation and decreased intrinsic motivation"[32].

In the business world research with adults studying for an MBA also makes the point[33]. Students who were invited to set themselves learning goals for the first year of their programme achieved higher grades than those who were invited to set themselves an outcome goal for the end of the year. They also expressed greater satisfaction with the programme by the end of the year.

Person AND situation - the classroom

There is a common tendency to talk about learners as though they have one orientation or the other, but the evidence does not support this view. The most recent research shows that how the task is described - "to help you learn" versus " to see how good you are" - can influence a learner's orientation more strongly than the disposition that learners bring to the task[34]. This is a vital point for recognising the contribution made by the classroom.

The classroom is influential as a collective climate. Even measuring this as the simple average of all individuals' orientations shows that a class-average learning-orientation has a positive effect on individual achievement gains, while class-average performance orientation has a negative effect[35].

The classroom is influential through the messages it conveys, and even young learners spot them. They can perceive whether a situation is encouraging a learning orientation or a performance orientation, and they can learn to associate these orientations with their identities as a learner[36]. In later years more variation appears. In a survey of 30 classes of 10 year-olds, classes had significantly different orientations, as did the learners[37]. Pupils' orientations were not totally defined by their classroom: for example, some learners perceived teachers' expectations as predominantly competitive, yet maintained a learning orientation for themselves.

Within classrooms, children may show different orientations in different fields, such as reading and maths[38]. In this study differences across large-scale variables, such as ethnicity and socio-economic status, were few, which suggests that local features of the classroom are more powerful.

Trends across the school years, achievement and school climate

Beyond classroom differences, wider patterns and trends exist. Evidence suggests that the goal climate in classrooms becomes steadily more performance-oriented over the years of schooling.

In primary school, students with a high learning orientation and low performance orientation had the most adaptive thinking as well as actual achievement[39]. Yet a longitudinal study of 431 US pupils in the later primary years showed that they become less learning-oriented and more work avoidant[40].

At transition to secondary school, learning practices could be disrupted as a new environment is encountered. First year students in a Dutch secondary school showed no connection between learning orientation and achievement[41]. By fifth year, however, those students with a learning orientation showed strong connections with achievement.

Yet moving up the early secondary school years, classrooms become less learning-oriented: as a result 400 11 and 12 year-olds endorsed personal learning goals less strongly, and achieved lower grades[42].

In secondary school, differences between classroom situations are fewer[43] and the school culture plays a greater role in influencing classroom practices[44]. Throughout secondary school, learning orientation is significantly correlated with grades, whereas performance approach is not[45]. So a performance-oriented school culture is linked with poorer motivation and greater disengagement predicting lower attainment: this could be a key element in explaining "the long tail of under-achievement" in secondary schooling in England.

Beyond secondary school, by the time they reach a college environment, students who adopt a high learning orientation and high performance orientation achieve the highest levels of achievement in that context: they display the highest levels of motivation, cognitive strategy use, and self-regulation[46].

And at undergraduate level some studies show that a learning orientation is associated with highest performance[47].

Within this picture of the changing context over the years of schooling, some individuals proceed despite the context. Those 8 to 12 year-olds with a learning orientation show more stability in their orientation, motivation and self-regulation[48]. Perhaps that orientation is more resilient for individuals. And for contexts, learning orientation is more influential: perceived changes in the learning orientation of classrooms have more effect on performance than changes in the performance orientation[49].

The change of orientations over time is viewed by some writers as a developmental phenomenon[50], but this is an individual view and risks ignoring social context. Instead we can view the trends over time as reflecting the culture in our schools. Key elements of a school's learning culture include the views of learning, what it is and how it proceeds, as well as what has come to count as achievement in the organization. Here again there are differences across the school years.

So as educational institutions become more selective and the culture becomes more performance oriented, high learning orientation remains central to achievement, but it is not supported by the classroom culture. So a more limited group of students than could be the case are those who will succeed.

If performance orientation is dominant in the culture without a developed learning orientation, there is an increase in strategic behaviour rather than learning behaviour, a focus on looking good rather than learning well, and a tendency to perceive education as a process of jumping through hoops, rather than something more transferable and lasting. This is not a strategy for success[51].

But returning to the detail of the classroom, how are these influential differences in orientation created?

Teachers are central

Central to the message system of the classroom is the teacher. One major study[52] identified four classrooms with significantly different motivational profiles. Over two terms, observation focused on teachers' talk and practices, and the following features were found to be consistent across time, and consistently different between the teachers.

In a learning orientation classroom (LoC):

- the tasks generate participation by all, and equal participation is established
- talking and working happens in pairs, threes and mixed groups
- the class is engaged in generating rules, and then there is freedom of way of working.

In a performance orientation classroom (PoC):

- the tasks are to volunteer responses to teacher
- whole class lessons dominate. There is little cooperation and students keep their work private from others
- rules and sanctions are repeated, along with procedures to be followed.

In addition, in a LoC:

- praise is informative and credible
- the message is that improvement is the focus
- peers seek and give help to each other
- performance in tests is not linked to other factors such as ability or prestige.

Whereas, in a PoC:

- praise is used for behaviour or for neatness
- teachers are only available to answer questions at designated times
- there is much talk of tests and their importance, and students enquire if this task is to be graded.

So a learning orientation classroom has to contain learner-centred practices rather than mainly teacher-centred. Nevertheless the researchers described all four classrooms as "broadly teacher-led" and went on to identify a crucial new element: the comments teachers made about how students learn:

- In a LoC teachers spoke about learning as an active process that requires student involvement and discussion; that understanding - rather than memorization and replication - is important; and that interaction is a key feature.
- In a PoC teachers spoke about learning as an individual process achieved by listening and following instructions; correct answer is the goal, following procedures is the method.

A later study[53] separated teacher comments on learning which focused on the current teaching transaction from those which were independent of the current transaction. The latter included teachers' comments about their own thinking and learning, and distinguished classrooms with their different orientations considerably more than any other part of the discourse. The study concluded "By modeling their own thinking processes, learning-oriented teachers demonstrated that being unsure, learning from mistakes, and asking questions were natural and necessary parts of learning".

So two key elements are identified in the classroom:

1. how teachers talk about their students' learning
2. how teachers talk about their own learning

These elements suggest what is necessary in order to do better than teacher-centred performance-focused classrooms.

Improving classrooms

Classrooms are the influential site in creating achievement at school. They have their impact not through particular practices but through the learning climate they create. When classrooms create a thoughtful and learner-centred climate, achievement is high.

When it comes to improving classrooms, many approaches focus on the teacher's techniques. They attempt to do "more of what works", where "what works" has been decided from reductionist research on teaching. As a result they often create more of the same - teacher-directed classrooms with low agency for learners.

Classroom improvement which enhances learning requires two consecutive shifts:

- from teacher-centred towards learner-centred
- and then towards learning-centred classrooms.

These two shifts are consecutive because attempts to accelerate the process and move directly from teacher-centred classrooms to learning-centred classrooms usually entail the imposition of a teacher-centred language of learning. Research since the 1970s has shown that this does not have the intended positive effects[54]. It is an example of what learning-oriented researchers have called a "lethal mutation" of their findings[55]. When research-based learning-centred classroom practices are subsequently packaged and promoted, they become teacher-centred practices, omit the principles of learning, and lose their positive effects.

The shift from teacher-centred to learner-centred has been described[56] along three dimensions:

- more active learning, so that learners are not merely more active through creating, deciding, and so on, but are also more actively learning through the explicit review of their experience and the meaning-making this involves
- more collaborative learning, so that learners come to see themselves and others as resources in meaning-making, rather than teacher being sole fount of knowledge
- more learner-driven learning, so that learners come to drive the agenda as they generate questions, organise inquiry and evaluate their own products and progress.

When these three dimensions are present to some extent in a classroom, it becomes possible to address a fourth (which has less of a history in classrooms, and in research):

- more learning about learning, so that learners come to see themselves as such, develop authentic language about their experiences of learning, and come to propose improvements for how their learning can be developed.

If learning-centred change is applied to a classroom which does not have a degree of learner-centredness, the change will not stick.

The first shift to learner-centred has significant effects. When the classroom is learner-centred, students develop a different orientation to their learning. Middle schools students report more positive forms of motivation and greater academic engagement when they perceived their teachers were using learner-centred practices (survey of 2200 students)[57]. As students' perceptions of their teachers' classroom practices became more learner-centred, not only did academic performance increase (as assessed by both teacher classroom grades and standardized achievement tests), but non-academic outcomes such as motivation to learn, school attendance, and school disruptions also improved (survey of 4,203 upper elementary and middle school students)[58]. A positive orientation towards learning, including a desire to develop competence and improve intellectually, was reported by adolescents when they perceive their teachers as using learner-centred teaching practices (survey of 4615 middle and high school students)[59]. And a recent meta-analyses concludes: "Overall, learner-centered teacher variables have above-average associations with positive student outcomes"[60].

One of USA's leading experts in this field recently highlighted the issue in making the second shift "I can hardly think of anything more worth learning than learning to learn. It's like money in the bank at compound interest. Unfortunately, most settings of learning give very little direct attention to learning the game of learning"[61].

Learning about Learning - key ideas

The term "learning about learning" is chosen for the remainder of this paper, while recognising that other terms are also used.

The literature on this area has shown considerable growth in recent decades and now there is a dedicated journal: "Metacognition and Learning". Figure 1 depicts the number of texts (not including those on machine learning) which use the terms "learning about learning", "learning to learn", "learning how to learn" and meta-learning.

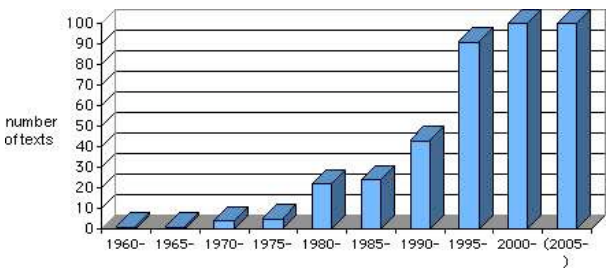

Figure 1. Growth of literature on learning about learning

The term "metalearning" denotes learning about learning, whereas metacognition denotes thinking about thinking. Just as learning involves more than thinking, so metalearning involves more than metacognition, for instance learning about goals, feelings, social relations and context of learning. The term has even recently appeared in an Ofsted school inspection report[62] - thanks to a Year 4 child who explained it to the inspector.

Over these decades, understandings and approaches to classroom interventions have also developed. At first the focus was on teaching skills and strategies. There were many competing conceptualizations, most of which took a deficit view of learners. When a group of students is taught that a particular strategy is good for learning, some of the students are saying to themselves "But I don't use that strategy – so I must be worse than I thought". Thus a well-meaning programme can have a negative and disempowering effect if it seems to suggest that there is a single way of being an effective learner[63].

Evidence showed that the skills did not transfer to other situations than the ones in which they were taught[64]. A major review concluded that direct teaching of "study skills" to students without attention to reflective, metacognitive development may well be pointless[65]. As a leading researcher put it "Gradually it became apparent that the children's failure to make use of their strategic repertoire was a problem of understanding: *they had little insight into their own ability to learn intentionally; they lacked reflection*"[66]. So interventions started to help students focus on strategies at the same time as they think about and monitor their learning.

Then came a focus on learning "styles", which appeal to schools' tendency to categorise learners. However the research demonstrates that the origins of the great number of unrelated models are shaky, the measurement is unreliable and the impact on pedagogy is negligible[67]. But with so many vested interests and overblown claims, this form of talk sometimes continues.

Nowadays it is better understood that skills and preferences may be some part of the picture but:

> effectiveness as a learner hinges on the ability to be versatile as a learner, to have a rich view of learning and a learning orientation which is in turn linked to the ability to plan, monitor and review one's learning - aspects which metalearning promotes.

Strategies may play a role, but some may be more important than others. Distinguishing:

- metacognitive study strategies (e.g. monitoring)
- deep strategies (e.g. meaning-making)
- surface strategies (e.g. rehearsal)
- resource management strategies (e.g. time)

evidence from university students shows that metacognitive study strategies are more important for achieving high exam scores. And these strategies strongly link to a learning orientation[68].

Context remains important for learning about learning. Helping students to better read and

respond to the demands of the school context has successfully enhanced skills in reading, writing, homework and test-taking. This was attributed to the programme which acknowledged students' out-of-school skills, harnessed extra-school strengths in the service of school work, and based skill-building on students' own experiences[69]. This also acts as a reminder that school students may have richer learning experiences outside school, and that school can usefully build skills from such experiences.

Situational enquiries have been important in other research teams. Cartoon formats have been developed which depict typical school situations and invite learners to fill in a speech bubble and a thought bubble for the participants. These have been shown to illuminate learning contexts from the pupils' perspective, and contribute to reflective dialogue between pupils and teachers[70].

So a view of learning about learning has developed which is:

- Appreciative and strengths-based, rather than deficit-based
- Focused on learners' lived experiences of learning
- Focused on multiple contexts, including those outside school
- About planning monitoring and review
- Highlighting the meaning of learning.

The language of learning which is appropriate here is not a provided language (such as skills) or a divisive language (such as styles) but a narrative language for communicating experiences, rising above and building a richer picture[71].

Is there any evidence that classroom practices based on such a view have any effect on performance?

Classroom Practices

Learning about Learning in Pre-School

Young children's learning is often under-estimated. Yet 3 to 5 year-olds can transfer learning from a single example of a problem, based of principle, not surface features[72]. This learning can be accelerated by a key practice: asking them to explain. 3 year-olds then perform as well as 4 year-olds (twice as well as the 3 year-olds who did not reflect). By age 4, children's own explanations promote transfer better than those provided by an adult.

Young children's conceptions of learning develop over time. With 3 to 8 year-olds, conceptions of *what* they learn developed from (a) to do something, (b) to know something, to (c) to understand something; conceptions of *how* they learn developed from (a) learning as doing (b) learning as growing older, to (c) learning through experience, either passive with the passing of time or active with practice[73].

This development was accelerated with teaching practices designed to promote children's greater awareness of their own learning[74]. Through what were called "metacognitive dialogues" (i.e. meta-learning dialogues) the children were asked to reflect and ponder about what they were doing and why they were doing certain things which are normally taken for granted, for example:

"How come that we [did X] yesterday?"

"Did you find out anything that you didn't know before?"

"How did you go about finding out?"

"Can you find out some more on that by tomorrow?"

"How would you go about teaching other people all you have learnt about this?"

Finally it was shown that "children who have been involved in this form of educational activity [including meta-learning] are better prepared for learning (understanding new content)". 6 year-olds showed greater understanding in real-life learning experiments than did their peers in parallel groups[75].

Children also showed a richer conception of learning: when asked *"If you were the one who had to decide what the children will have to learn next, what would you suggest?"* their answers were more about learning to know than about learning to do. When asked *"Imagine you are as old as your teacher, and have to teach children in another pre-school all that you have learned [about X], how would you go about that?"* their answers were more about teaching by planning experience, rather than teaching by telling.

These studies have indicated the significant impact of two important classroom practices:

1. making learning an object of attention

2. making learning an object of conversation

Other projects pairing 4 year-olds and 8 year-olds concluded "children learn many things at school, but they very rarely have a chance to learn about the process of teaching and learning"[76] .

Film studies of nursery and reception class children show that they have more metalanguage than their educators expect, especially about them taking strategic control (problem solving, planning, predicting, explaining and monitoring progress)[77]. Educators expressed awe at their skills, while the researcher concluded with one major assertion: that educators' ventures into this field would result in "unexpected revelation" - surprises!

Learning about Learning in Primary School

6 to 12 year-olds In inner-city classrooms were part of "Fostering Communities of Learners"[78]. They were (i) encouraged to engage in self-reflective learning, and (ii) act as researchers who are responsible to some extent for defining their own knowledge and expertise. This enhances children's emergent strategies and metacognition, and helps them advance each other's understanding in small groups. The program was successful at improving both literacy skills and subject knowledge. Rates of comprehension doubled, and ways of explaining became more connected. Children developed flexible learning and inquiry strategies of wide applicability.

Tasks in such classrooms are open in order to develop choice and self-control. In literacy such tasks helped 6 year-olds in 12 classrooms develop intrinsic motivation, metacognition and strategic behaviour[79]. Similarly, writing activities in classrooms supporting self-regulated learning helped 7 and 8 year-olds monitor and evaluate their writing in productive ways, use peers effectively, and see teachers as collaborators[80]. 9 year-olds preferred tasks which are challenging, collaborative, and multi-day: these lead to pupils being less performance-oriented, and less work avoidant especially the low-achieving pupils. A key feature is that tasks demand planning and dialogue. High challenge tasks (e.g. essays on own choice of topic, letters to politicians, research papers, letters to next year's class) were preferred over low challenge tasks (e.g. worksheets on vowels, pronouns, and vocabulary, spelling and handwriting exercises). Pupils view the latter as boring and requiring minimal thought[81].

In some classrooms (but only a minority) opportunities are provided for students to develop metacognitive awareness and strategies about the task of reading. Teachers help learners become more aware of how they learn and acquire or refine strategies for the learning of reading, for example, thinking out loud, and suggesting ways of tackling a task. They elicit children's prior knowledge and help them verbalise their experiences[82].

When we add an explicit focus on learning, children engage with the opportunity to talk about processes and learn about them. As some leading experimenters found "Involvement and enthusiasm have generally been high. Students who have not liked writing have nonetheless seemed to like analysing the task and the process"[83].

How learning and performance are discussed Is important. Pupils whose performance deteriorates after a failure experience because of attributing to themselves a lack of ability can be helped by attributing success and failure to effort or strategy rather than to ability. Then their performance (10 year-olds completing arithmetic tasks) after subsequent failure experiences did not deteriorate[84].

Learning about strategies and learning about learning go best hand-in-hand. Skills which help learners to regulate their own learning and become competent in planning are crucial. 10 and 11 year-olds learning to use problem-solving software also took part in monitoring exercises, described by the authors as metacognitive training. They performed better than those without the training. They were more successful with the more complex problems, they succeeded more quickly, and overall they employed more effective strategies, because they started by reflecting on a problem and considering the possibilities before proceeding[85]. Similarly, 10 year-old pupils who learned about goals and strategies in learning sometimes improved their performance, but they also needed meta-learning in order to use the learning strategies[86].

In learning-centred classrooms practices which support review and reflection are important. Keeping a "learning journal" of the learning journey has proved successful[87]. As Lynne, 10 years, put it: "As I write I notice and understand more too." A wide range of prompts can help to capture and review aspects of the learning journey, including those suggested by learners. Reflection is crucial for developing some distance from the immediate experience. A learning journal also creates a running record to look back over at a later stage of review.

The act of writing about one's learning requires attention and demands verbalisation: it also makes one's ideas available for consideration with peers.

Review with video can be powerful. 6 year-olds in a reading recovery programme re-viewed videos of the sessions and were invited to re-call their strategies. They demonstrated greater metacognitive awareness than during the lessons, and it was more about their strategies and knowledge of reading, rather than just self-correction. All made significant progress in reading. This emphasises that the development of metacognition may be scaffolded in a range of ways, including with young learners[88].

So beyond
- making learning an object of attention and
- making learning an object of conversation,

we now include
- making learning an object of reflection.

The dominant classroom culture will show through: recent interviews with 10 - 11 year olds found that "all the children interviewed were able to talk easily about their learning. It became clear that they did not believe that they had any choice or control of the activities within the core subjects and only a limited choice in the methods that they used"[89].

Learning about Learning in Secondary School

For nearly 25 years it has been known that students with more elaborated conceptions of learning perform better in public examinations at age 16[90]. Lower attainment at that age is correlated with perceived pressure from adults, while higher attainment is positively related to independence, competence and a meaning-oriented approach to learning. The more students are supported as autonomous learners, the higher their school performance, as demonstrated by the grades in French, Maths, Biology and Geography (263 15 year-olds in Canada)[91]. Better academic performance relates to a learning orientation and a malleable view of ability: these also link with positive motivational beliefs, higher use of learning strategies, and self-regulation (434 12 and 13 year-olds)[92].

More recent data confirms the explanation: students with qualitative and experiential conceptions of learning were likely to use meaning-oriented approaches, whereas students with quantitative conceptions of learning tended to use surface

approaches[93]. Learning orientation is significantly associated with adaptive learning strategies, and performance orientation with maladaptive learning strategies (229 12 year-olds in USA)[94]. Learning orientation is also associated positively with students' beliefs that they are able to regulate themselves and their learning.

The classroom environment is again a contributor. When students view classrooms as having a learning orientation they have positive coping strategies and positive feeling; by contrast, when they view classrooms as having a performance orientation there is defensive coping and negative feeling (880 students in USA)[95].

Classrooms which promote meaning-oriented approaches to learning encourage active participation and the use of investigative skills (484 students in Australia)[96]. In science, students who believe that it is about constructing ideas engage more actively and use more meaningful strategies: those who believe understanding is the best strategy for learning science scored highest in examinations (180 14 year-olds)[97].

These findings hold across different subjects in the secondary school. Where subject differences occur, they are less pervasive than similarities (545 12 to 14 year-olds)[98]. Student self-regulation did not differ by subject area, and links with performance were very similar across English, maths and social studies.

Students with a rich conception of learning are more active metacognitively. They engage in "on-line theorising", ask questions which focus on explanations or discrepancies, venture ideas, use personal experiences, and give more elaborate explanations[99] . Their comments in class included:

- self-evaluating their ideas: "I've figured out what I want to say",
- recognising blocks "No, I don't get it",
- maintaining commentary "I didn't draw that right: I'm getting confused", and
- self-questioning when problems arose "What am I going to do?" "Have I come across this before?" and "What do I know about this?"

Classrooms can help students towards a richer conception. Asking them to share their ideas and discuss with each other the status of their conceptions, has led to more permanent restructuring of their understanding[100]. Through the Metacognitive Learning Cycle the teacher found "It definitely changed the climate of the classroom: the metacognitive class definitely had livelier discussions, … and became more involved in the class - especially some students that would not normally have been involved. Especially some of the girls".

Peer talk can be very helpful, especially if structured into one asks and the other explains. The ability to construct knowledge improved, both during the interaction and on written measures[101]. These effects between 12 year-olds did not only occur when one partner was more knowledgeable or competent (as some views on paired work assume).

Student-generated questions are more effective than provided ones: they can help an individual learner be more effective in situations which do not promote it: 15 year-olds trained in the strategy during classroom lectures showed greater comprehension than those involved in discussion or self-review. Self-questioning improves performance raising the mean from 50% to 64% on standardised tests and to 81% on task-related comprehension tests[102]. Students maintained the strategy when external prompts were removed.

Self-explaining in reading can help learners perform better. Students asked to self-explain after reading each line of a passage had a greater knowledge gain than those who read the text twice. Prompts to self-explain are the most beneficial in producing deeper meaning and co-construction[103].

A programme in science classrooms set its aim as "Increased learner awareness of the nature and process of learning"[104]. Prompts and reviews were devised to increase students' awareness and control of their own learning. Lessons often included discussions of the purposes of learning, questionnaires about learning, and discussions about the relative roles of teacher and student in learning. After 6 months, 15 and 16 year-olds showed greater understanding of content and more purposeful learning, while the teacher had changed to allow more learner control. A project to generalise the strategies[105] showed the need to pay attention to context, purpose, support and assessment methods. These influenced whether students accepted the meta-learning strategies and saw them as fruitful. Earlier orientations can be slow to change: for example, after 8 months two students came to their science teacher:

One said: "We see what all this is about. You are trying to get us to think and learn for ourselves"
"Yes, yes" replied the teacher, heartened by this long-delayed breakthrough, "That's it exactly"
"Well" said the student "we don't want to do that"

Meta-learning helps learners move beyond technique to effective use of learning strategies. Data from nearly five thousand 14 and 16 year-olds and college / university students showed that students with higher meta-learning selected appropriate strategies and deployed them effectively, with enhanced performance: those students with low meta-learning appeared to use strategies without metacognitive involvement and their use did not correlate well with performance. "They appear to be functioning in the same way as 'techniques' or 'tactics', i.e. as short-term props to learning that do not involve any metacognitive insight on the part of the learner"[106]. A lack of development through school was suggested: "Even at the upper end of the secondary school, however, many students do not appear to have the meta-learning capability to use learning strategies appropriately". The general picture of 14-15 year-olds' ideas about their learning is that they have no clear understanding of how they learn[107].

For the teacher, small classroom changes can have significant effects. When teachers describe thinking processes or suggest strategy use, a significant difference occurs[108]. Yet on average such suggestions occurred in only 9% of observed lessons, and in only 2% did they suggest use of a learning strategy. This was most frequently urging use of learning aids ("Use your calculator" "check you answers with the map") and, less frequently, metacognitive monitoring ("look back and see how you've done"). Teachers varied in suggestion-making, ranging from 0 to 7.2% of lesson segments. Yet differences in this range had significant effect in promoting learners' use of strategies: so small increases can be effective.

The above studies illustrate the fourth element in classroom practices:
• *making learning an object of learning*

Students can investigate their own learning and experiment with learning strategies[109]. In the process they build a vocabulary of learning and learning discourse. In a UK secondary school, low-achieving 13 year-olds could all focus on learning as a topic of conversation and participate in reflective discussion about their own and peers' learning[110]. This challenges the prevalent idea that low attainers need simplification.

Tensions in Improving Classrooms

Other reviews of recent research about learning and its contexts suggest that the change needed in classroom management in learning-centred classrooms is fundamental and long-term, and that one element is reconceptualising learning[111]. This is in sharp contrast to teacher-led, pressurized quick fixes, which unwittingly emphasise ancient conceptualisations of teaching.

Predictable tensions will arise in the improvement process. Many of the classroom changes will be packaged and sold in such a way that they lose their focus on learning[112]. Therefore attention must be given to how teachers think about learning and thus interpret the new practices. Some evidence already suggests that teachers vary: some take a narrow view of learning to learn and their role in supporting it, whereas others take a broad view[113].

The dominant culture will continue to provide tensions. Recent evidence from a developmental research project suggested that 80% of classrooms conformed to the letter of assessment for learning interventions, while 20% embodied the spirit of the intervention which is the promotion of learner autonomy[114]. Teachers in the latter classrooms had a sense of their own agency. The tensions between values and practices which are highlighted in trying to develop classrooms which focus on learning can be identified by beginner teachers[115].

But it would be an error to conclude that the movement towards learning-centred classrooms was in some way a "new" view. Over 350 years ago, one writer summed up the vision as:

> "Let the beginning and the end of our didactics be: seek and find the methods where the teacher teaches less but they who sit in the desks learn more. Let schools have less rush, less antipathy and less vain effort, but more well-being, convenience and permanent gain"[116].

This description reflects well the outcomes of learning-centred development in classroom and school projects recently: we have described it as "composed learners, and composed schools".

Improvement at the School Level

While the classroom is the influential site for creating achievement at school, the culture of the classroom is significantly influenced by the culture of the school. Improvement of a learning-focussed type requires that the school:

- creates the climate or culture within which there can be a focus on learning
- creates a safety zone within which risk can be encouraged and supported
- provides the necessary structures, resources, spaces and opportunities for all members of the community to collaborate in the focus on learning
- makes the learning public and celebrated
- pays attention to the learners who might be silenced, vulnerable, dispossessed, taken care of
- seeks out and works towards overcoming barriers to learning for the young people, the adults and the organisation[117]

International studies show that such projects:
- improve the learning environment in classrooms;
- create models of professional development for school; and
- provide valid knowledge about learning and teaching issues in classroom settings[118].

Learning-centred school improvement can not be a "top down" process - this actually reduces the school's capacity to self-organise, i.e. to learn[119], and has long been associated with the predictable failure of many educational reforms where "teachers regard students the way their superiors regard them"[120] - as basically unable to take responsibility.

Instead it must be a process through which trust is built, so that a culture of innovation may develop, teachers come to regard themselves as learners, and a sense of all parties being co-learners evolves. The key condition for promoting learner autonomy is classroom-focused inquiry by teachers[121]. Schools which succeed in this field make support for professional learning a priority. And in the process the current demoralisation of teachers is reversed: "The current performance-orientated climate in schools in England seems to make it difficult for teachers to practise what they value. Engaging teachers in critical inquiry fosters a greater alignment between their values and their practices"[122].

Learning, Performance and Improvement

The role of leaders is to provide their staff with the space and permission to innovate, and perhaps learn from failure. The challenge for school leaders is to embed learning-centred principles into both structure and culture of the school[123]

When teachers are subjected to "strong" accountability, they are more likely to say that it is a waste of time to try to do one's best as a teacher[124]. By contrast when teachers learn more about learning, the effectiveness of a school improves and increased performance follows, especially for many of the underachieving students[125].

Conclusion

If we understand better the relationship between learning and performance, how does improvement occur? Clearly it does not occur through the common process where schools under pressure pass it on to teachers who pass it on to pupils. The evidence reviewed here suggests that a culture change in our classrooms can increase performance through the process of promoting more effective learning. More autonomous learners are also more likely to collaborate, and are more likely to be self-regulating.

Schools differ greatly in their focus on learning. These differences relate to students' learning in a systematic way. Schools with emphasis on autonomy and moderate stress on achievement are associated with learning for understanding. Those with strong emphasis on formal academic achievement have counter-productive effects on learners (50 schools in Australia)[126].

Pressures from external sources are unlikely to go away in the immediate future, but a school can adopt a learning response to being under pressure for results. It would enquire: how do we get our best results? What can we learn from that which we can apply elsewhere? How much are these "results" representing our goals as a school?

In the field of economics, Goodhart's Law[127] suggests that when a measure which was seen as a performance *indicator* is turned into a target, the system will distort. Similar laws exist in social sciences and assessment. In such a context the twin challenges for schools are:

1. to recognize that passing tests is not the goal of education, but a by-product of effective learning
2. to recognize that even when we want pupils to do their best in tests, pressure and performance orientation will not achieve it

The research outlined in this paper is part of a wider shift in a number of education systems to change the focus from teaching to learning[128]. The purpose of this shift is to pay greater attention to what learners do, the orientation of the learner and learner motivation. The prize to be gained from this shift is not merely enhanced performance, but (more crucially) more effective and motivated learners, with improved relationships for our classrooms, schools and beyond.

Questions to promote understanding, reflection and application

Which aspects of this paper made most immediate sense to you?

What did you notice about your reading of this paper - how you went about it, what helped, what hindered?

What did you do with any parts you found hard to understand?

Do you have any opportunity to talk over your experience with any other readers of this paper? If not, how could you organise such?

How would you summarise (to yourself and perhaps to others) the main messages:

- on the effect of pressure on performance
- on how high levels of performance are achieved
- on learners' various orientations to learning
- on how classrooms may contribute to the development of a learning orientation
- on the tensions to be faced in developing learning-centred classrooms
- on the elements of learning-focused school improvement

What experiences have you had to date in which a focus on learning was built in a classroom? How did this happen, and how could more of it happen?

Have you had conversations with your pupils which help them to narrate their best experiences of learning? What did you notice about the experience of doing this, and of the content of their stories?

Are there 'classroom tweaks' you can imagine yourself trying, towards a more learner-centred or learning-centred classroom climate? With whom will you discuss what you notice in your tweaks?

Where could the process of improvement start most effectively in your school?

What issues would need to be addressed for it to develop beyond that starting point?

To what extent do teachers in your school feel themselves to be professional learners? How might this be enhanced further?

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