

RESEARCH AREA & SOURCE	DESCRIPTION & MAIN FINDINGS / ARGUMENTS
<p>Brain Research - <i>Science Daily</i> Oct. 16, 2001</p>	<p>Mental Math Dependant on Language, Researchers Find</p> <p>Jyotsna Vaid of Texas A & M University investigated variables that affect language preference for performing mental arithmetic and for thinking to oneself. The study was conducted with 500 bilingual (Spanish-English) college students and the variables investigated were: language of elementary school instruction, length of residence in the United States, age of second language acquisition and degree of proficiency in the second language.</p> <p>Main Findings:</p> <ul style="list-style-type: none"> • Although capable of performing mathematical computations in either language, 95 percent of participants reported a single language preference. Their strong preference was for the language in which they first learned math skills. • All variables except for age of second language acquisition predicted language preference for thinking to oneself, though the strongest predictor was amount of exposure to the language (length of time in the U.S.).
<p>Teaching Strategies - Literacy <i>Journal of Educational Psychology</i> Vol. 99, No. 3, pp.445 - 476</p>	<p>Graham, Steve and Perin, Dolores (2007) A meta-analysis of writing instruction for adolescent students.</p> <p>These researchers conducted a meta-analysis of 123 studies into writing interventions with students from Grades 4 – 12. For each study a weighted effect size (on the quality of student writing based on a holistic measure) was calculated related to the treatment variable (the particular instructional intervention). 14 different instructional strategies were covered by the studies. The effect sizes for each of these strategies were compared.</p> <p>Main Findings:</p> <p>The following strategies were recommended as being empirically proven to improve the quality of student writing. They are listed in order of magnitude of the effect size and the effect sizes are listed in parentheses. (Generally, an effect size of 0.20 is considered small, 0.50 is</p>

medium and 0.80 is large)

- Teach strategies for planning, revising and editing writing (0.82). (The effect was even larger when students were taught to self-regulate the use of these strategies.)
- Teach strategies and procedures for summarizing material (0.82)
- Have students collaborate to plan, draft, revise and edit their writing. (0.75)
- Set clear and specific goals for what students are to accomplish with their writing (0.70)
- Make it possible for students to use word processing tools (rather than writing by hand) (0.55)
- Teach students how to join clauses to make increasingly complex sentences (0.50)
- Provide teachers with PD in how to implement a process writing approach (0.46) Without PD this strategy had an overall effect of only 0.03.
- Involve students in activities designed to sharpen their inquiry skills (0.32)
- Use activities that help students gather and organize ideas prior to writing (0.32)
- Provide and jointly analyze good models of writing (0.25)

The effect of the following strategies on the quality of student writing was unclear, often due to circumstances related to the original studies or to the small number of studies conducted relating to that strategy.

- The teaching of the structure of various text types
- Providing extra opportunities to write
- Giving feedback on writing

	<ul style="list-style-type: none"> • Providing guides, prompts or heuristics to guide student writing <p>One strategy was shown to have no positive effect on the quality of student writing:</p> <ul style="list-style-type: none"> • Direct instruction of grammar <p># Note: Direct grammar instruction did not have a positive effect in any of the studies included in the analysis. The researchers warn that these results should be interpreted with caution. There is some evidence emerging that teaching functional rather than traditional grammar may have a positive effect.</p> <p>Only experimental and quasi-experimental studies were included in the meta-analysis and only those which specifically examined the effect on the overall quality of student writing. This led to some strategies not being included in the analysis, such as:</p> <ul style="list-style-type: none"> • Teaching spelling, handwriting, punctuation and vocabulary • Conferencing student writing • Procedures to boost student motivation <p>The studies included in the analysis provide no guidance on how much of the recommended activities is needed, or on how these activities could be combined effectively.</p>
<p>Curriculum Development / Assessment / Learning Skills</p> <p><i>The Curriculum Journal</i> Vol. 18, No. 2, pp. 195 - 210</p>	<p>Csapo, Beno (2007) Research into learning to learn through the assessment of quality and organization of learning outcomes.</p> <p>This article summarizes the results of a number of studies conducted over nearly a decade in Hungary. The knowledge of students in Grade 7 and Grade 11 was assessed on four levels - (1) teacher grades (2) objective knowledge tests based on the curriculum (3) assessments of the quality of knowledge (eg level of student understanding of content, ability to apply knowledge on novel contexts – this included assessment of Science application, misconceptions, Math understanding, spatial reasoning, historical reasoning etc.) and (4.) higher order thinking skills (considered to be essential in order to acquire ‘high quality’ knowledge – this included assessment of inductive and deductive reasoning, correlative reasoning, critical thinking, verbal analogies etc.). Students were also given questionnaires to collect background information including information about their motivation and self-concept.</p>

Main Findings:

- Teacher grades correlated highly with the results of knowledge tests in Math and Science but the correlation was quite low for history and literature.
- Much lower and in many cases insignificant correlations were found between teacher grades and measures of understanding and ability to apply knowledge. No relationship was found between teacher grades and historical reasoning.
- In general grading is more consistent in Math and Science but teachers seem to lack a firm basis for assigning grades in other subjects.
- The mean result for student acquisition of knowledge was around 50% indicating that students do learn a significant proportion of what they are expected to learn. However, large variations were observed according to the level of education of parents indicating that student learning may be shaped more by factors outside the school than within it.
- Student performance on assessments of understanding and application was low.
- Analyses that studied the relationships between variables indicated that students appear to have two independent bodies of knowledge - one mastered within the context of school and another originating from everyday experiences. The school knowledge appears to be virtually unusable outside the school context and the everyday knowledge is more pragmatic but often leads to false generalizations. Transfer appears limited in both cases.
- Correlational analyses revealed a major role for inductive and especially analogical reasoning in learning with understanding.
- Comparisons of results of the two grade levels indicated that higher order thinking skills were found to develop very slowly and that some even decrease over the years. For example it appears that the longer students spend in school the less likely they are to be able to recognize and accept probabilistic relationships.
- Affective variables also showed a negative tendency - the longer students were in school the more negative attitudes they had towards subject areas (English as a foreign language was the only exception to this.)
- In other studies by the same researchers it was found that specific training in higher order thinking skills within the context of the learning

	<p>of subject matter clearly removes the obstacles that hinder 'high quality' learning.</p>
<p>Assessment</p> <p><i>The Curriculum Journal</i> Vol. 18, No. 1, pp. 39 - 56</p>	<p>Buhagiar, Michael (2007) Classroom assessment within the alternative assessment paradigm: revisiting the territory.</p> <p>This article examines some of the key concepts related to assessment (such as validity, reliability, objectivity etc.) and relates them to ideas about assessment of learning as opposed to assessment for learning.</p> <p>Main Arguments:</p> <ul style="list-style-type: none"> ● Assessment developed historically for the purposes of selection and certification and therefore a premium was put on techniques that appeared to be fair and objective and on high levels of reliability. ● Traditional assessment is <i>learning unfriendly</i> (narrow, sudden death, non-informative), <i>curriculum unfriendly</i> (emphasizes rote learning), <i>teacher unfriendly</i> (encourages a 'testlike' teaching program), <i>student unfriendly</i> (leads to labeling, unmotivating) ● Assessment in the new paradigm accepts that assessment is inexact and not necessarily objective. It tells us what learners can do in particular circumstances. ● Assessment for learning distances itself from traditional views of reliability and validity. The qualities of a trustworthy assessment are <i>credibility, transferability, dependability, authenticity</i>. ● The main difference between formative and summative assessment is not the assessment itself but the use to which the information is put. ● Assessment for learning must include components of self- and peer assessment. No matter how good the feedback from the teacher is, students still need to become self-monitoring learners. ● Learners must grasp the learning goals and be able to compare them with their present understanding. They must also progress in their strategic knowledge of how to improve their own learning.
	<p>Black, P., McCorkick, R., James, M. and Pedder, D. (2006) Learning how to learn and assessment for learning: a theoretical inquiry.</p> <p>This article explores the construct 'learning how to learn' and relates it to assessment for learning based on the results of different pieces of</p>

research.

Main Arguments:

- Learning how to learn is cannot be separated from learning itself and is best viewed as a set of 'learning practices' rather a set of separate learning skills that can be taught
- Problem solving is central to learning. Learning as problem solving can be seen as a situation where the goal is to learn and problem solving is the vehicle. Students will not necessarily learn unless they are trying to learn - investing effort in both solving a given problem and transferring their learning to unassigned problems associated with their understanding. Learning must be *intentional*.
- Learning to learn involves four elements: (1) knowledge about cognition - realizing the degree to which you understand (2) self-regulating strategies - planning what to do next and evaluating the progress (3) agency - taking responsibility for the direction of learning (4) collaboration - effective group interactions encourage students to think about their understanding
- Three particular 'learning practices' have been shown by research to be effective: (1) lessons designed to challenge students' ways of reasoning and thereby develop a set of reasoning skills (Shayer, 1999) (2) group tasks where students practice ways of collaborating in discussion to develop reasoning and problem-solving (Mercer, 2000) (3) Assessment for Learning practices (Black & Wiliam, 1998).
- Three of the Assessment for Learning practices that research has shown to be effective are: (1) encouraging teachers to frame their questioning so that it explores key features of learning (2) giving content-only feedback on written work, with the requirement that students respond to the comments by further work (3) the development of peer- and self- assessment.
- Emphasis should be placed on practices that have the potential to promote learner autonomy as this would seem to be the most secure foundation for lifelong learning.

Assessment /
Learning
Skills

Meijer, Joost (2007) Cross-curricular skills testing in The Netherlands.

*The
Curriculum*

This article reports on the results of two cohorts of students on a test of cross-curricular skills in The Netherlands. The students were tested at the end of the eighth Grade and then again three years later. Other testing was conducted with the same students to measure intelligence, academic achievement and social-affective factors. Curricula from the schools involved were also investigated to determine the extent to

<p><i>Journal Vol. 18, No. 2, pp. 155 - 173</i></p>	<p>which the cross-curricular skills were emphasized. The cross-curricular skills test was based on the following set of skills : 1. Conducting observations 2. Selecting and ordering information 3. Summarizing and drawing conclusions 4. Forming opinions 5. Recognizing beliefs and values in opinions and actions of oneself and others 6. Distinguishing opinions from facts 7. Working together on assignments (cooperation) 8. Requiring quality of one's own work (process demands as well as product demands)</p> <p>Main Findings:</p> <ul style="list-style-type: none"> ● The correlation of performance on the cross-curricular skills test with scholastic achievement was twice as high as the correlation of performance on the cross-curricular skills test with intelligence. ● There was also a modest correlation between performance on the cross-curricular skills test and social affective factors. ● In general, there was an increase in performance on the cross-curricular skills test between the first cohort (1993 – 1995) and the second (1996 – 1998), which the researchers suggest could be attributed to increased attention to these skills by schools.
<p>Assessment / Learning Skills</p> <p><i>The Curriculum Journal Vol. 18, No. 2, pp. 135 - 153</i></p>	<p>Crick, Ruth (2007) Learning how to learn: the dynamic assessment of learning power.</p> <p>The researchers designed an assessment instrument to measure what they termed 'learning power'. Variables which have an impact on an individual's capacity and motivation to learn were identified from a range of studies and using factor analysis seven dimensions were identified.</p> <p>In this piece of research teachers were given learning profile data about their students based on the assessment instrument (ELLI – Effective Lifelong Learning Inventory) and invited to design interventions to help their students become better learners based on the data. The practices of the participating teachers were examined to identify underlying pedagogical themes.</p> <p>Main Findings:</p> <p>The seven dimensions are can each be placed on a continuum as follows: 1. <i>Changing and learning</i> - Learning itself it learnable----- the ability to learn is fixed 2. <i>Critical curiosity</i> - Desire to get to the bottom of things----accept what they are told uncritically 3. <i>Meaning-making</i> - Look for links to what is already known----approach to learning is fragmented 4. <i>Dependence and fragility</i> - Like a challenge / have perseverance-- -easily disheartened and dependent on others for learning 5. <i>Creativity</i> - Able to look at things in different way----rule bound 6. <i>Relationships / interdependence</i> - Good at balancing social and private learning---either dependent or isolated 7. <i>Strategic awareness</i> -</p>

Self-aware and reflective----robotic

The key themes which emerged from the teacher's efforts as being essential to improving learner's ability to learn were:

- Teacher commitment to learner-centred values and willingness to make professional judgements
- Positive interpersonal relationships characterized by trust, affirmation and challenge
- Developing a meta-language of learning, particularly through the use of metaphor
- Modeling and imitation
- Learning dialogue (discussions about learning)
- Time for reflection
- Development of learner self-awareness and ownership
- Providing students with choice and the responsibility for making choices
- Sequencing of learning materials - creating challenge through reorganizing the content of learning (particularly - creating situations where students are challenged to make sense of data and make meaning from it and inviting students to make connections with other aspects of the curriculum and with their wider life experiences)

For anybody interested in the particular assessment instrument used, information can be found at: <http://www.ellionline.co.uk/>