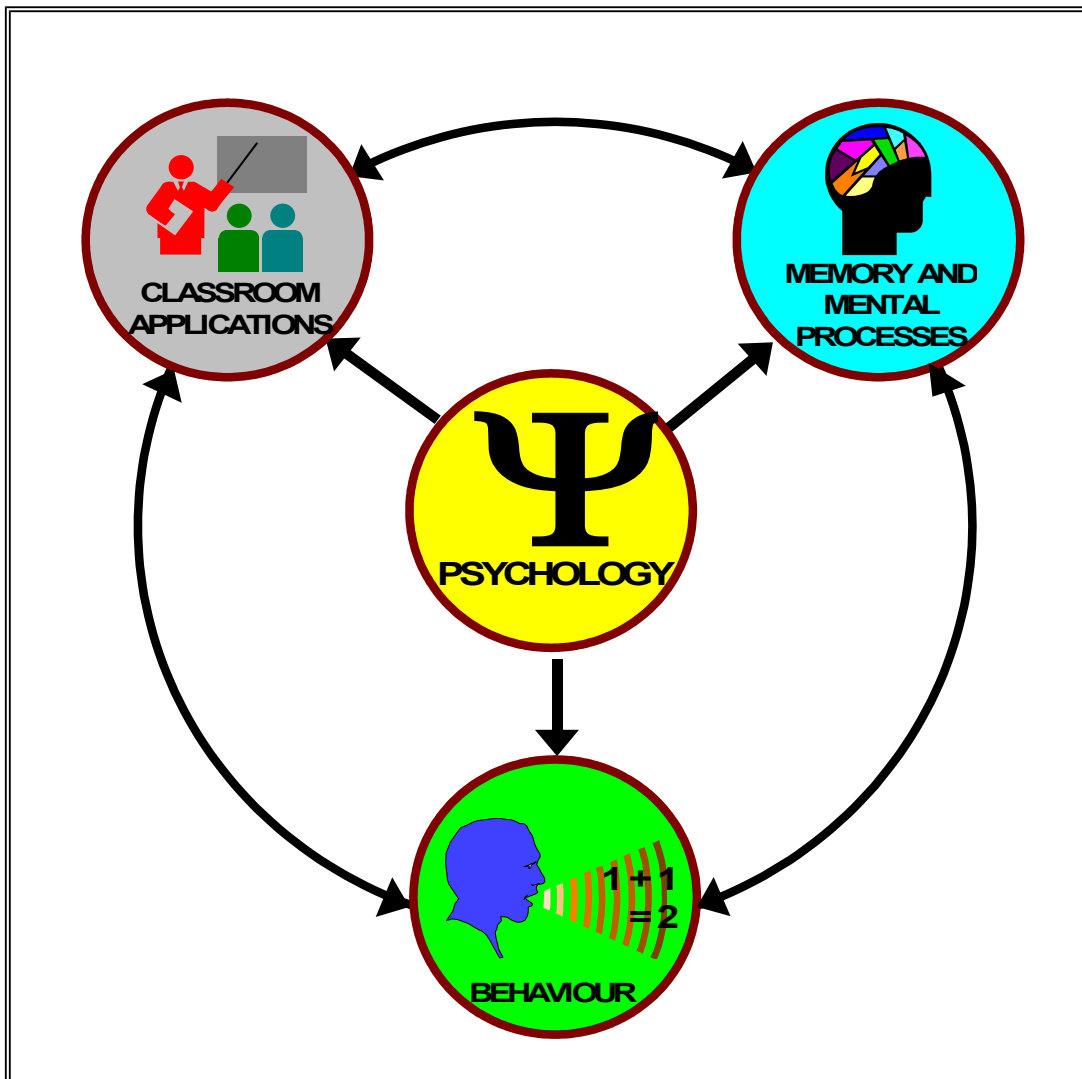


COURSE EDD 5301:

# PSYCHOLOGY OF LEARNING AND TEACHING 1: *COGNITIVE PROCESSES*



# Course Outline

## **INSTRUCTOR:**

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### **Cover picture**

The symbol  $\Psi$  is the letter 'psi'/'psy' in the Greek alphabet and is the first letter of the Greek word for psychology, with 'psych-' meaning 'of the mind.' The four nodes in the picture together with their interconnections symbolize the way knowledge may be represented in the mind.

# Aims of the course

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1. To provide some key skills needed for use in your teaching and learning.
2. To provide a theoretical background for learning and teaching which can be used to increase the effectiveness of your instruction.
3. To supply background knowledge in order for you to reflect on the nature of learning so that over time, improvements may be made in the teaching of your students.

Aims 1 and 2 should be achieved in the present course. Aim 3 is a long-term aim, intended to provide material that can be used not only during the course but in subsequent years.

## General approach to course work

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1. Individual study: Before each class session, you are expected to have looked over the notes and to have attempted any exercises.
2. Class sessions: These will include lectures, some experiments and discussions.
3. Project and test: A test and a project are included (see below). On the completion of each lesson you should give thought as to how ideas introduced in that lesson can help in your project. Each lesson will contribute something and you are strongly advised to begin work well before the deadline.

## Course outline

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### 1. An introduction to the subject of psychology

- Defining psychology
- A brief history of the subject from the ancient Greeks to present day theories of learning with the introduction of some key psychological ideas
- The relation of psychology to other disciplines

### 2. Educational psychology

- The focus of educational psychology
- The key role of understanding in learning
- Some essential characteristics of understanding
- Levels of learning

### **3. Paradigms for studying teaching and learning**

- The behavioural and cognitive paradigms
- The traditional (behavioural) approach to learning: Conditioning and reinforcement in learning
- The traditional approach to teaching: process-product research, methodology
- Limitations to the behavioural paradigm
- The information-processing model of human memory:
  - components of the model, particularly STM, LTM and WM
  - how is language represented in memory? Instructional implications
- Capacity limitations in human memory:
  - STM and limitations
  - WM and processing loads
  - chunks and chunking
  - reasons for limitations
  - instructional implications
- Two basic processes:
  - selective attention and perception
  - classroom implications

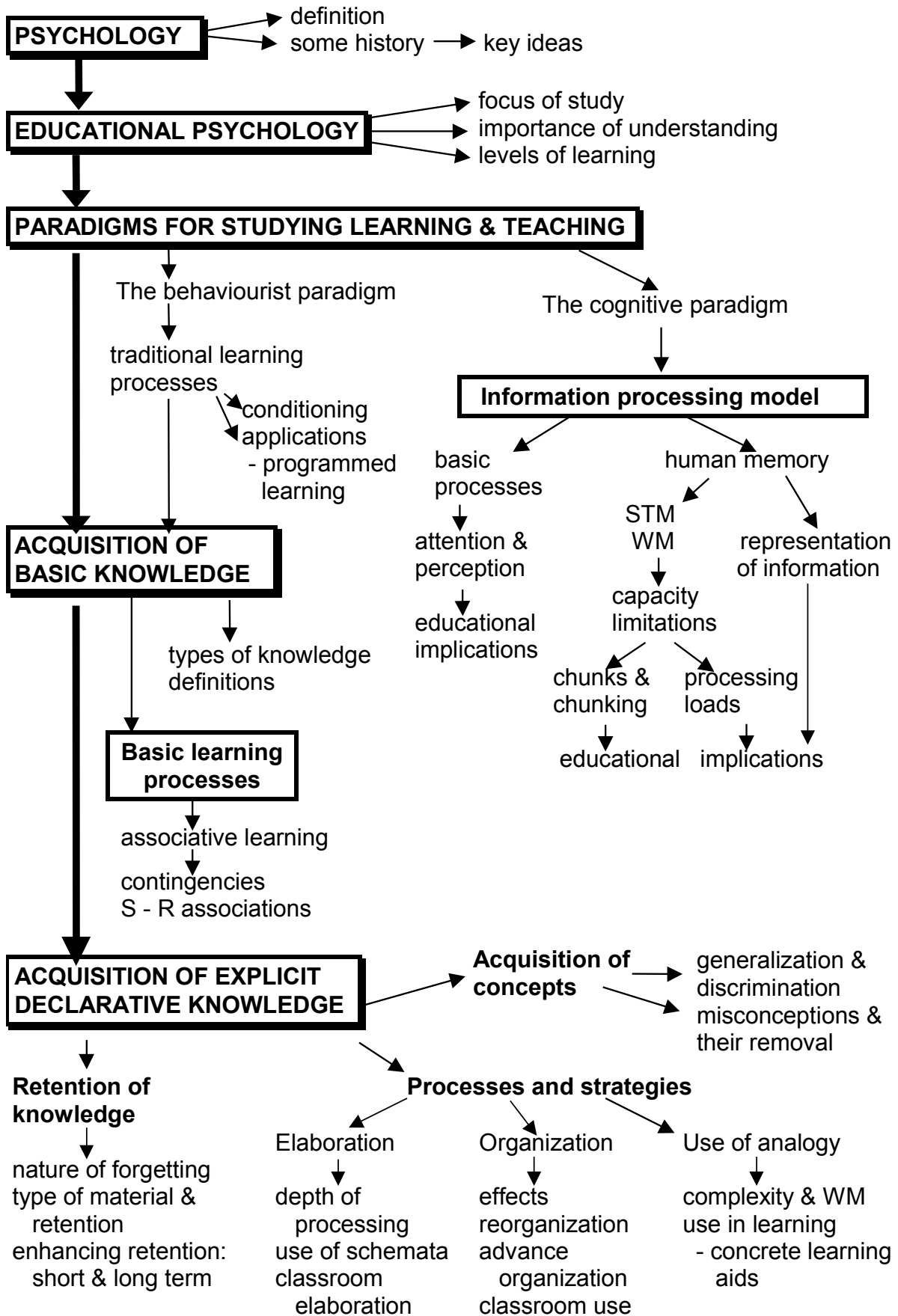
### **4. Acquisition of basic knowledge**

- Definitions of learning.
- Types and levels of learning.
- Basic learning processes.

### **5. Acquisition of explicit declarative knowledge**

- Acquisition of concepts:
  - generalization and discrimination
  - misconceptions in learning
  - correcting misconceptions
- Strategies for acquiring declarative knowledge:
  - elaboration
  - elaboration and language processing: introduction to schemata
  - elaborative strategies for teaching and learning
  - organization, reorganization and advance organizers
  - analogies and their use in teaching and learning
  - concrete teaching-learning aids as analogies
- Retention of acquired knowledge:
  - memory and forgetting
  - enhancing retention including spacing and cyclic learning

# Flow chart of the course



# Course requirements

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A Multiple choice in-class test. (30%)

B A project entitled 'The application of psychological ideas to learning and teaching.' (70%)

- For this project, work in pairs with someone from the same subject discipline.
- Choose 8 ideas introduced in this course. Select a variety rather than too many that are all closely related.

Take each idea in turn, discuss its meaning and show how the idea can be applied to the teaching of any part of your subject.

Then discuss how the 8 ideas can be applied in the teaching of one (or two) specific lessons. Some form of lesson plan(s) should be included to show where the ideas are used.

Notes:

1. The emphasis is on the application of psychological ideas to education; projects that do not do this will receive little credit (e.g. projects that concentrate on subject matter rather than psychology.)
  2. More credit will be given for a well-integrated discussion of the ideas rather than a discussion of each idea separately, i.e. how ideas overlap and relate to each other.
  3. The project should be organized/structured in a manner that facilitates reading and comprehension. For example, you might like to use some of the organization strategies taught in the course.
- The project can be typed or neatly handwritten.
  - Length of project: About 12 pages (excluding any appendices you may wish to include).
  - The method of assessment is as follows:

Assessment point	Marks		
1 (a) The variety of the psychological ideas selected, and the appropriateness of these to the subject matter. (b) The organization and integration of the ideas	1	2	3
2 Your understanding of the ideas and their <u>general</u> application to the teaching of your subject.	1	2	3
3 The application of the ideas to the <u>specific</u> lesson(s)	1	2	3
4 Possible bonus for special quality ( <u>not</u> quantity).	0	1/2	1

Marks: 3 = good, 2 = satisfactory, 1 = weak.

Maximum possible mark = 10

- **Warning:** *Do not copy or use any material from another student, a book or an article as if it were your own. This is plagiarism which is a serious offence and penalties are in place for anyone caught committing it. Note however that excerpts from other work may be used if proper reference or acknowledgement is included.*
- Hand in project by: \_\_\_\_\_ Collect graded project: \_\_\_\_\_

# Course materials

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There are no set books for the course. The handouts should provide most of the material you need. However, a brief list of library books and articles is provided in case you wish to do further reading.

## Books

- Anderson, J.R. (1980 or 1990). *Cognitive psychology and its educational implications*. San Francisco, CA: Freeman & Co.
- Gagne, E.D. (1985). *The cognitive psychology of school learning*. Boston, Mass.: Little, Brown.
- Klatzky, R.L. (1980). *Human memory: Structures and processes*. San Francisco: W.H. Freeman.
- Halford, G.S. (1993). *Children's understanding: The development of mental models*. Hillsdale, N.J.: LEA.
- LeFrancois, G.R. (1988). *Psychology for teaching*. Belmont, CA: Wadsworth.
- Lindgren, H.C. and Suter, W.N. (1985). *Educational psychology in the classroom*. 7th Edition. Brooks/Cole.
- Mayer, R.E. (1987). *Educational psychology: A cognitive approach*. Boston, Mass.: Little, Brown.
- Slavin, R.E. (1991). *Educational psychology: Theory into practice*. Boston, Mass.: Allyn & Bacon.
- Wittrock, M.C. (1986). *Handbook of research on teaching*. Washington, DC: American Educational Research Association.
- Woolfolk, A.E. (1993). *Educational psychology*. Boston, Mass.: Allyn & Brown.

## Articles

- Allport, D.A. (1980). Attention and performance. In G. Claxton (Ed.), *Cognitive psychology*, 112-153. London: Routledge and Keegan Paul.
- Bower, G.H., Clarke, M.C., Lesgold, A.M., and Winzenz, D. (1969). Hierarchical retrieval schemes in recall of categorical word lists. *Journal of Verbal Learning and Verbal Behaviour*, 8, 323-343.
- Dansereau, D.F. (1985). Learning strategy research. In J. Segal, S. Chipman, and R. Glaser (Eds.), *Thinking and learning skills, Vol. 1: Relating instruction in research*. Hillsdale, N.J.: Erlbaum.
- Derry, S.J. (1990). Learning strategies for acquiring useful knowledge. In B.F. Jones and L. Idol (Eds.), *Dimensions of thinking and cognitive instruction*, 347-379, NCREL/Erlbaum.
- Glynn, S.M. and DiVesta, F.J. (1982). Outline and hierarchical organization as aids for study and retrieval. *Journal of Educational Psychology*, 69, 89-95.
- Halpern, D.F. et.al. (1990). Analogies as an aid to understanding and memory. *Journal of Educational Psychology*, 82(2), 298-305.
- Hyde, T.S., and Jenkins, J.J. (1973). Recall for words as a function of semantic, graphic and syntactic orienting tasks. *Journal of Verbal Learning and Verbal Behaviour*, 12, 471-480.

- Johnsey, A. et.al. (1992). Using elaboration strategies training in computer-based instruction to promote generative learning. *Contemporary Educational Psychology*, 17, 125-135.
- Miller, G.A. (1956). The magic number of seven, plus or minus two: Some limits on our capacity to process information. *Psychological Review*, 63, 81-97.
- McCloskey, M. (1983). Naive theories of motion. In A.L. Stevens and D. Gentner (Eds.) *Mental models*, Hillsdale, N.J.: LEA.
- Peterson, L.R. and Peterson, M. (1959). Short-term retention of individual items. *Journal of Experimental Psychology*, 58, 193-198.
- Pressley, M. et.al. (1989). Good information processing: What it is and how education can promote it. *International Journal of Educational Research*, 13, 857-867.
- Pressley, M. et.al. (1992). Encouraging mindful use of prior knowledge: Attempting to construct explanatory answers facilitates learning. *Educational Psychologist*, 27(1), 91-109.
- Reder, L.M. (1980). The role of elaboration in the comprehension and retention of prose: A critical review. *Review of Educational Research*, 50, 5-53.
- Rundus, D. (1971). Analysis of rehearsal processes. *Journal of Experimental Psychology*, 89, 63-77.
- Shimmerlink, S.N., and Nolan, J.D. (1976). Reorganization and recall of prose. *Journal of Educational Psychology*, 68, 779-786.
- Shulman, L.S. (1986). Paradigms and research programs in the study of teaching. In M.C. Wittrock (Ed.) *Handbook of research on teaching*, 3-36. Washington, DC: American Educational Research Association.
- Thomas, J.W. and Rohwer, W.D. (1986). Academic studying: The role of learning strategies. *Educational Psychologist*, 21(1 & 2), 19-41.
- Thorndike, P.W. (1977). Cognitive structures in comprehension and memory of narrative discourse, *Cognitive Psychology*, 9, 77-100.
- Vosniadou, S. and Schommer, M. (1988). Explanatory analogies can help children acquire information from expository text. *Journal of Educational Psychology*, 80(4), 524-536.
- Weinstein, C.E. (1982). Training students to use elaboration learning strategies. *Contemporary Educational Psychology*, 7, 301-311.
- Weinstein, C.F., and Meyer, R.F. (1986). The teaching of learning strategies. In M.C. Wittrock (Ed.), *Handbook of research on teaching*, 315-327. Washington, DC: American Educational Research Association.
- Wittrock, M.C. (1974). Learning as a generative process. *Educational Psychologist*, 11, 87-95
- Wittrock, M.C. (1986). Students' thought processes. In M.C. Wittrock (Ed.), *Handbook of research on teaching*, 297-314. Washington, DC: American Educational Research Association.