

LECTURE WEEK 2

PSYCHOLOGY OF MATHEMATICS LEARNING

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BESMART.UNY.AC.ID

The screenshot shows the Be-Smart e-learning platform interface. At the top, it says "BESMART.UNY.AC.ID". Below that is a navigation bar with "Be-Smart" and "E-Learning Universitas Negeri Yogyakarta". The main content area is titled "Psychology of Mathematics" and includes a "Weekly outline" section with a "Course Description" and "Standards". There are also sections for "Must do for students" and "Upcoming Events". The interface is in Indonesian.

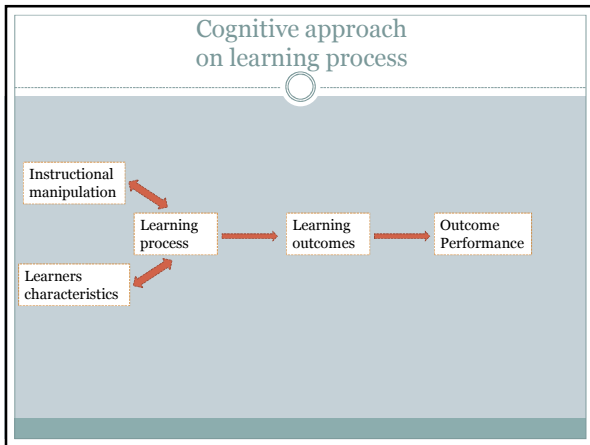
PLEASE, REGISTER YOURSELF!!

The screenshot shows a registration list on the Be-Smart platform. The list has columns for user name, ID, location, country, and registration date. The data is as follows:

Name	ID	Location	Country	Registration Date
Endah Retnowati			Indonesia	16 secs
1330241915 ENDAH KUSIRNI		KLATEN	Indonesia	36 mins 58 secs
1330241902 Dina Aldita Kristina		0	Indonesia	48 mins 28 secs
1330241961 CALVA ANANTA D M		YOOGYAKARTA	Indonesia	45 mins 36 secs
1330241967 Andina Yuliana Dewi		TEMANGGUNG	Indonesia	3 hours 22 mins
1330241953 Mariana Ramelan		KULON PROGO	Indonesia	3 hours 32 mins
1330244807 MUHAMMAD ALY SA'ID		BANTUL	Indonesia	4 hours 5 mins
1330241961 YUSITA BASMA AMINATI		YOOGYAKARTA	Indonesia	5 hours 44 mins
1330241942 Baja Nussalbah		BOYOLALI	Indonesia	6 hours 14 mins
1330241964 M A KHOLIQ ASFANI		YOOGYAKARTA	Indonesia	6 hours 50 mins
1330241956 Celia Adi Kurniandewi		KEBUMEN	Indonesia	1 day
Wahyu Wahyu Riharjo		YOOGYAKARTA	Indonesia	1 day 17 hours
1330241939 Rochah Yusuf		PURWOREJO	Indonesia	1 day 17 hours
1330241915 Dwi Aditya Karesani			Indonesia	3 days 4 hours
1330241949 Nurul Purnamingsih		BANYUMAS	Indonesia	4 days 2 hours

Review last lecture

- Behaviorist vs cognitivist
- Learning from cognitive psychologists perspective



Instructional manipulations

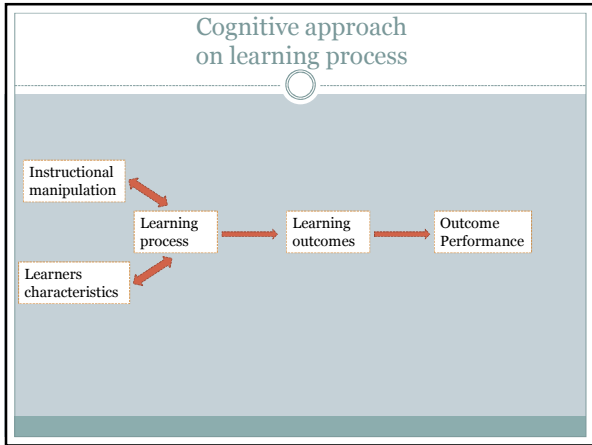
The sequence of external events including the organisation and content of instructional materials and behaviors of the teacher.

This includes what is taught, how it is taught and depends on the characteristics of the teacher and on the curriculum

Learner characteristics

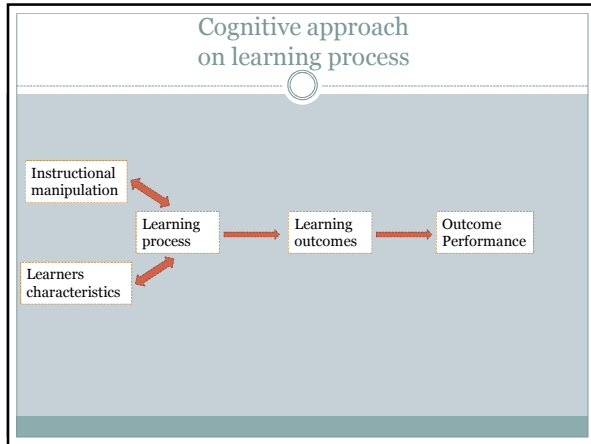
The learner's existing knowledge, including facts, procedures and strategies that may be required in the learning situation

The nature of the learner's memory system, including its capacity and mode of representation in memory.



Learning process

The learner's internal cognitive processes during learning, such as how the learner selects, organises & integrates new information with existing knowledge



Outcomes

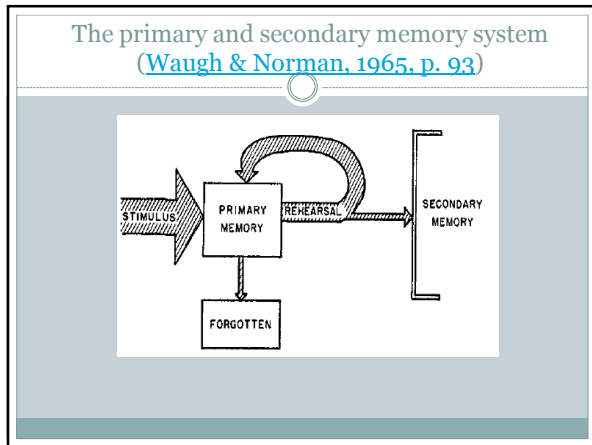
- **Learning outcomes**
 - The cognitive changes in the learner's knowledge or memory system, including newly acquired facts, procedures and strategies
- **Outcome performance**
 - The learner's performance & behaviour on tests that measure the amount of retention or the ability to transfer knowledge to new learning tasks

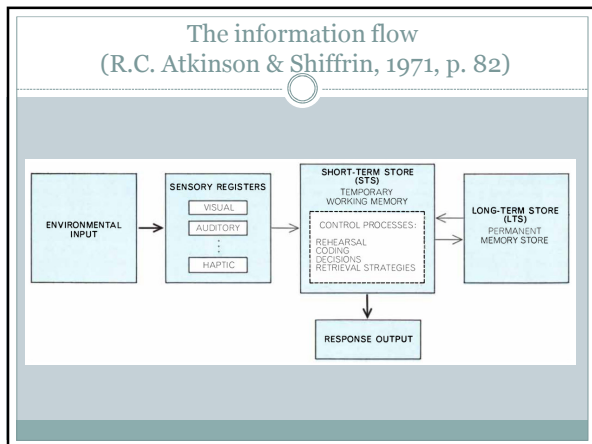
Two main points on learning process:

- **Learner centered approach**
 - Learner characteristics
 - Learning process and outcomes
 - Instructional manipulations affects changes in the learner's knowledge
- **Learner is an active information processor**
 - Knowledge is constructed by learner
 - HOW AND WHERE IS KNOWLEDGE IS CONSTRUCTED?

INFORMATION PROCESSING SYSTEM

- Human memory
 - Human cognitive architecture
 - ✦ The modal model





SENSORY MEMORY

1. Sight
2. hearing,
3. Smell
4. Taste
5. Touch

MOST RESEARCHED

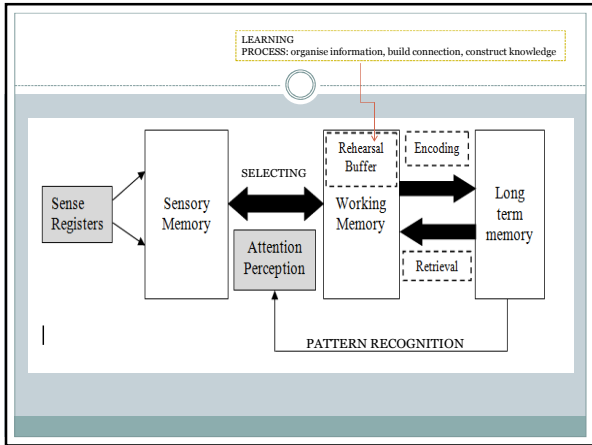
ICON Visual sensory register	ECHO Auditory sensory register
--	--

C	Z	K	L
D	P	M	B
R	L	X	N

Characteristics of sensory memory

- **LIMITED IN CAPACITY AND DURATION**
Sperling's & Darwin's research
7-9 pieces at once
only available for approx 1/2 second (for icon)
or approx 3 seconds (for echo)

WHAT IS THE IMPLICATION ON LEARNING?



STEPS ON SENSORY MEMORY

- ATTENTION AND PERCEPTION
- PATTERN RECOGNITION

↑

PRIOR KNOWLEDGE
CONTEXT

Jika tanggal 4 Juni 2008 jatuh pada hari Senin, jatuh pada hari apakah tanggal 27 Juni 2008?

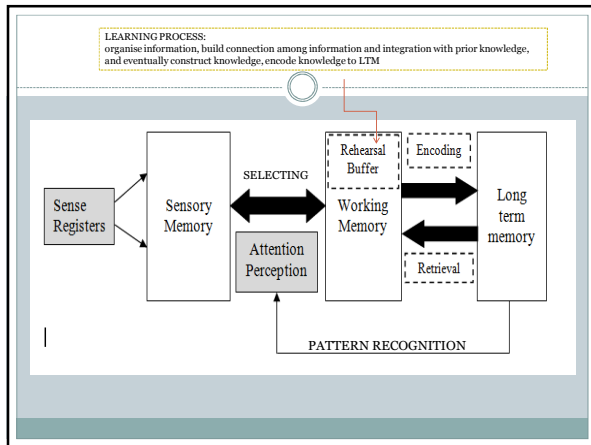
- Lecture
- Lettuce
- 27
- Kelapa
- Ice cream
- Cot
- Independence
- Building
- Icon
- 1965
- Sebaiknya
- Charger
- Moonlight
- Gula the kopi
- Bluw
- Amboi

WORKING MEMORY

- LIMITED IN CAPACITY AND DURATION
- Miller's research: The magic number of seven
- Cowan's research: Less amount

LONG TERM MEMORY

- Permanent storage of knowledge
- Unlimited capacity and duration
- Assist perception, attention, pattern recognition and retrieval processes



GROUP DISCUSSIONS

- Discuss to re-learn and express your understanding about:
 - Learning processes from cognivist perspective
 - How knowledge is constructed by learner
- Hint:
 - Refer to the diagram we discussed before

Today's remark:

- **How information is processed:**
 - Human cognitive architecture
 - The modal model
 - Sensory memory, Working memory, Long term memory
 - Educational implication
