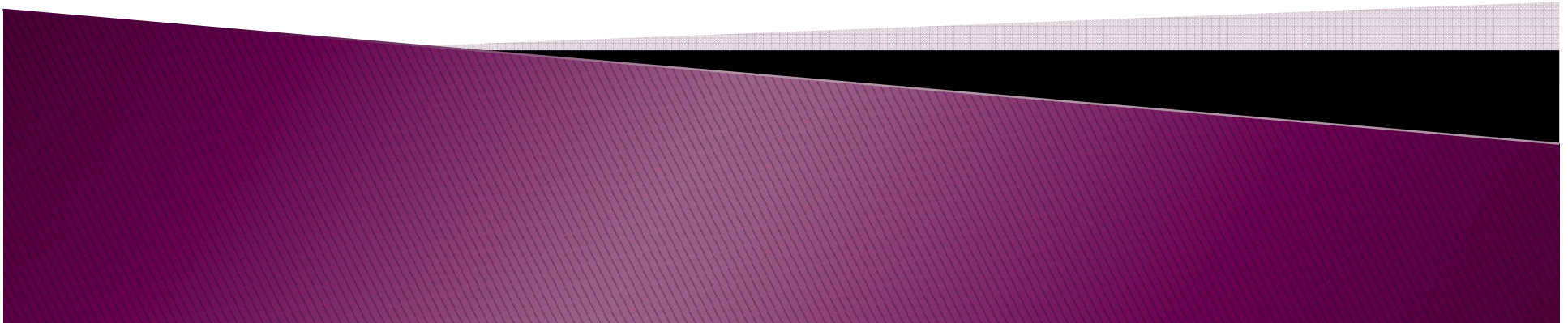# Internet & Project Competence 2008

Group 3:
Types of Instruction and Learning Theories

Sherry L. Ott, Taylor K. Capps, Jennifer S. Hinson, Ashton B. Ryan, Amie J. Travis, Danielle R. Reynolds, Valerie Reyes, Verena Kröger, Veronika Pfaller

Outline – Types of Instruction and Learning Theories
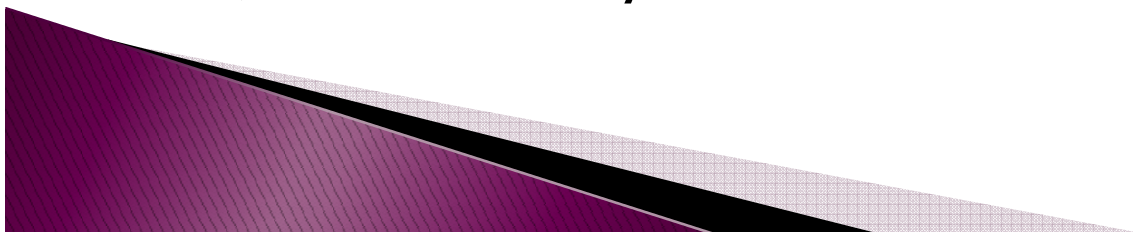
1. The main theories in the U.S. & Germany
   a) behaviorism
   b) information processing
   c) constructivism
2. Which theories are widely used?
   a) in the U.S.
   b) in Germany
3. Do teachers have to teach a certain theory or is there some flexibility?
   a) in the U.S.
   b) in Germany

4. Did the theories change or have teachers always been encouraged to teach a certain method?
   a) in the U.S.
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5. How are the theories taught to teacher education students?
   a) in the U.S.
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# 1. The main theories in the U.S. & Germany

a) <u>Behaviorism</u>

= a theory of animal and human learning that only focuses on objectively observable behaviors and discounts mental activities. Behavior theorists define learning as nothing more than the acquisition of new behavior.

▶ the two types of conditioning:

* <u>Classic conditioning:</u>

➢ occurs when a natural reflex responds to a stimulus.

➢ most popular example: Pavlov's observation that dogs salivate when they eat or even see food.

➢ Essentially, animals and people are biologically "wired" so that a certain stimulus will produce a specific response.
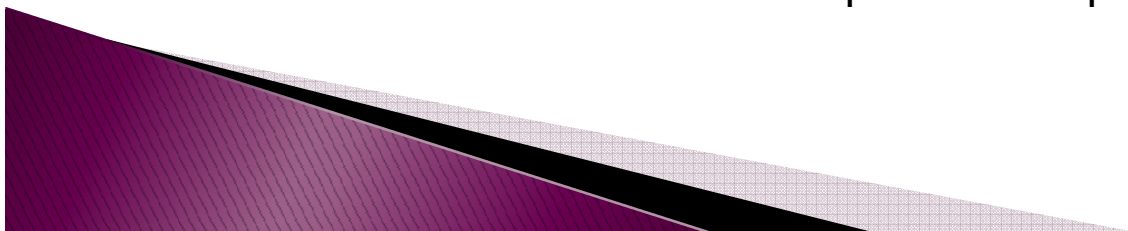
* Behavioral / Operant Conditioning:

➢ occurs when a response to a stimulus is reinforced.

➢ Basically, it's a simple feedback system: If a reward or reinforcement follows the response to a stimulus, then the response becomes more probable in the future.

➢ Example: leading behaviorist B.F. Skinner used reinforcement techniques to teach pigeons to dance and bowl a ball in a mini-alley.

▶ # Criticisms of behaviorism:

◦ Behaviorism does not account for all kinds of learning, since it disregards the activities of the mind

◦ Behaviorism does not explain some learning – such as the recognition of new language patterns by young children – for which there is no reinforcement mechanism

◦ Reserach has shown that animals adapt their reinforced patterns to new information. For instance, a rat can shift its behavior to respond to changes in the layout of a maze it had previously mastered through reinforcements
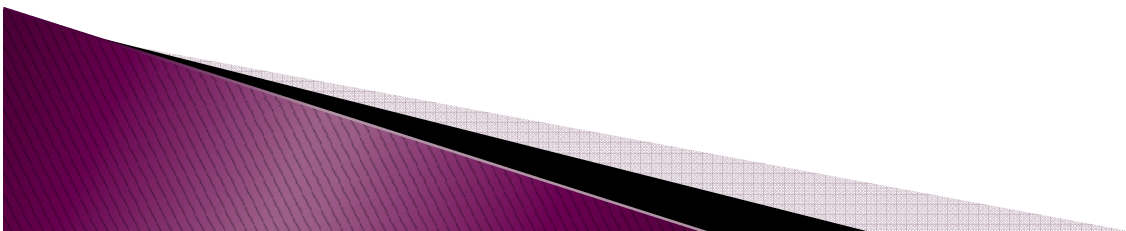
How behaviorism impacts learning:

- theory is relatively simple to understand because it relies only on observable behavior and describes several universal laws of behavior
- its positive and negative reinforcement techniques can be very effective – both in animals, and in treatments for human disorders such as autism and antisocial behavior
- behaviorism often is used by teachers, who reward or punish student behaviors
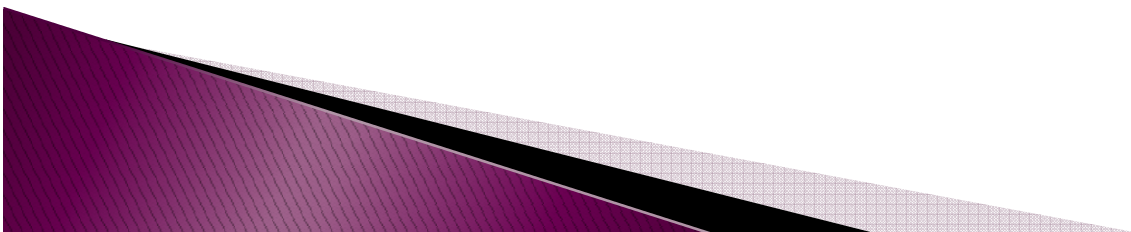
b) <u>Information Processing</u>

- Focuses on how people absorb their environment, encode information, and relate it to what they already know
- Considers how our minds store, transform, retrieve, and use information
- Includes information processing capabilities as a transition step between the environment and the behavior of the learner
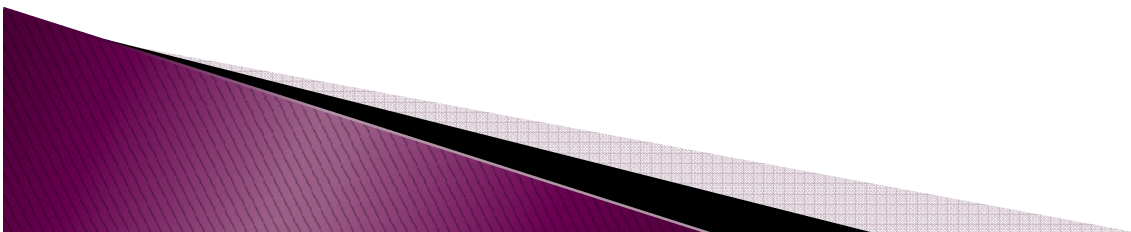
c) <u>Constructivism</u>

= a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each of us generates our own "rules" and "mental models," which we use to make sense of our experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences.

▸ there are several guiding principles:

◦ Learning is a search for meaning. Therefore, learning must start with the issues around which students are actively trying to construct meaning.

◦ Meaning requires understanding wholes as well as parts. And parts must be understood in the context of wholes. Therefore, the learning process focuses on primary concepts, not isolated facts.
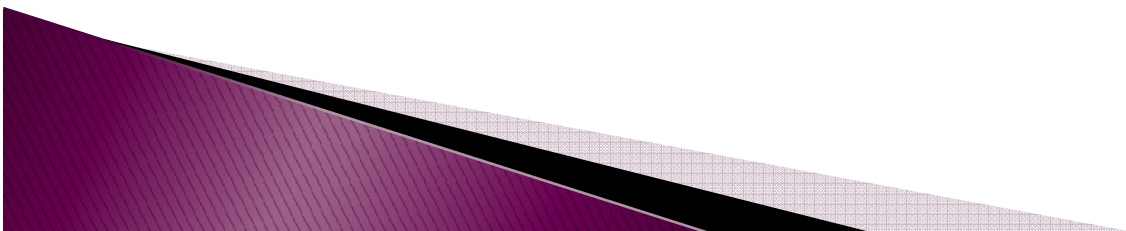
- In order to teach well, we must understand the mental models that students use to perceive the world and the assumptions they make to support those models.
- The purpose of learning is for an individual to construct his or her own meaning, not just memorize the "right" answers and regurgitate someone else's meaning. Since education is inherently interdisciplinary, the only valuable way to measure learning is to make the assessment part of the learning process, ensuring it provides students with information on the quality of their learning.
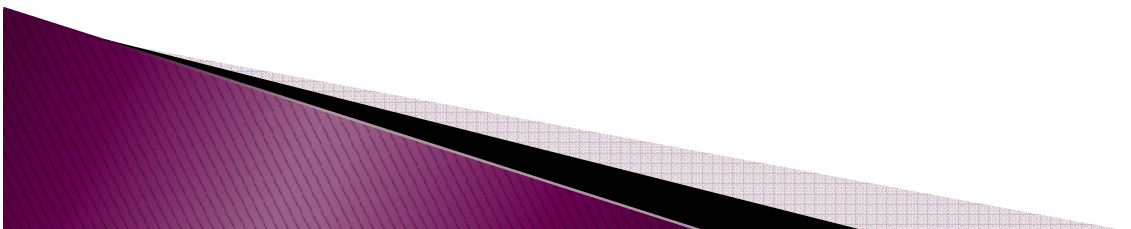
▶ How constructivism impacts learning:

- Curriculum: Constructivism calls for the elimination of a standardized curriculum. Instead, it promotes using curricula customized to the students' prior knowledge. Also, it emphasizes hands-on problem solving.
- Instruction: Under the theory of constructivism, educators focus on making connections between facts and fostering new understanding in students. Instructors tailor their teaching strategies to student responses and encourage students to analyze, interpret, and predict information. Teachers also rely heavily on open-ended questions and promote extensive dialogue among students.
- Assessment: Constructivism calls for the elimination of grades and standardized testing. Instead, assessment becomes part of the learning process so that students play a larger role in judging their own progress
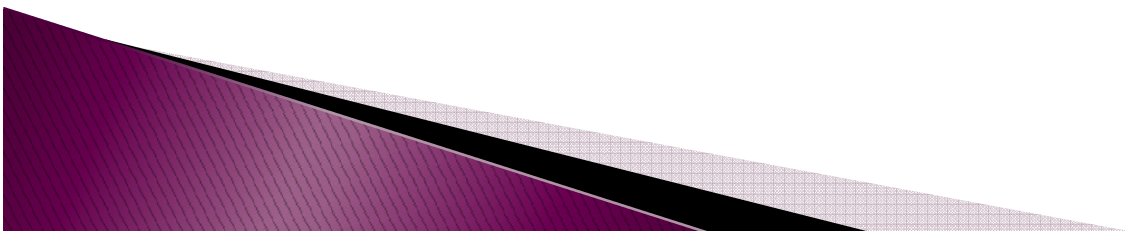
2. Which theories are widely used?

a) ## In the U.S.

Behaviorism is the primary learning theory used for creating lessons in the United States. The behaviorist theory is used the most because it a easier and more measurable than constructivism and cognitivism (information processing). Constructivist approaches have become more important and valued in the classroom because research shows children learn more from doing. In recent years, there has been a huge emphasis on the constructivist approach. We are taught all of the different learning theories, but the constructivist theory is stressed as the most affective for most lessons (not all) Possible Quote/Stat: "We Learn . . . 10% of what we read 20% of what we hear 30% of what we see 50% of what we see and hear 70% of what we discuss 80% of what we experience 95% of what we teach others."
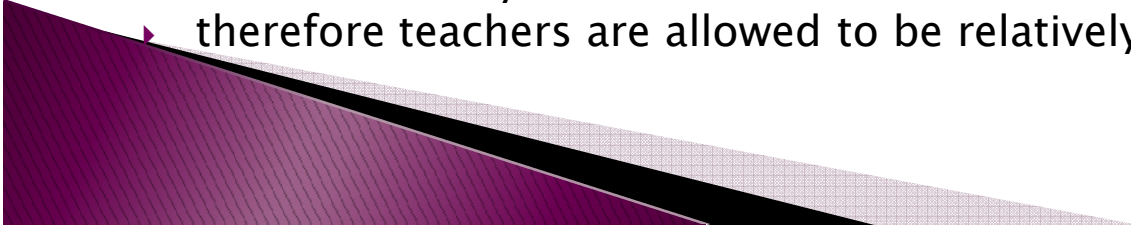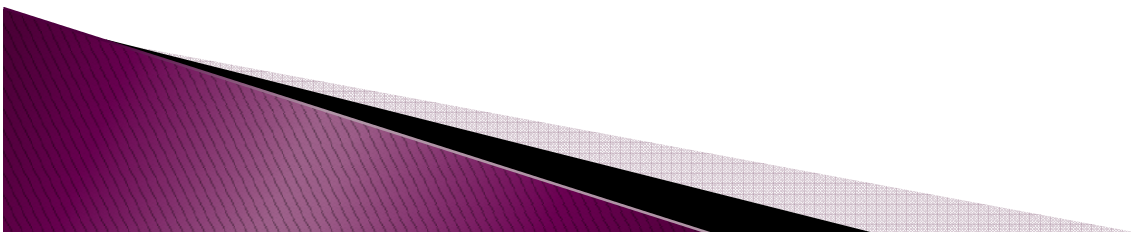
b) <u>In Germany</u>

‣ constructivist approaches gain more and more in importance in terms of teaching methods which aspire to an expanding personal responsibility of the students and therefore give bigger space to forms of selfsteered learning

‣ particularly in connection with a stronger individual support of students, aspects like feedback and selfappraisal or reflexion of learning progress have turned out purpose-leading

‣ <u>but:</u> It's also undoubted, that there exist issues, that could be communicated much faster and more effectively by introduction

‣ therefore, there is not just a constructivist approach to teaching nowadays!!

‣ nowadays we have a mixture of behaviorism, cognitivism (information processing) and constructivism, with a preference for the constructivist approaches.

‣ you can find parts of every theory in german elementary schools.

‣ the behaviorism theory can be found for example in the acquirement of factual knowledge, such as the multiplication tables or vocabulary

‣ the cognitive theory is used when the teacher makes aware, that the things students learn now are in connection, with things they've learned before

‣ the utilization of constructivist learning theory could be seen in the time of self-study – in every german elementary school classroom is an area, where the students can get material to work on during the lessons, if there is some time left

3. Do teachers have to teach in a certain theory or is there some flexibility?

a) <u>In the U.S. :</u> The teachers in the United States have flexibilty teaching which ever style they want to. In the classroom there are different type of learners so the teacher has to find a way for every child to be successful. Some teachers do behaviorst apporaches because they were raised doing that type of learning. Some teachers feel as though they should be more of a Constructivist teacher because that is what they believe will help the students best. Every teacher uses different types of theories in their classroom.
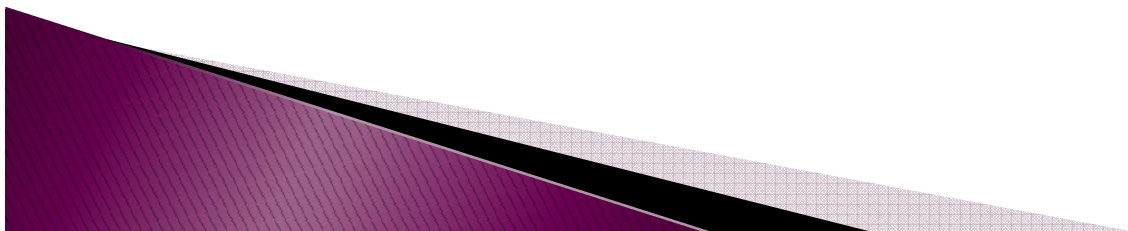
b) In Germany

- teachers have to create their lessons conform to a specific curriculum
- each state and each kind of school have their own curriculum
- Curricula are general planning instruments for the lessons and are remitted by the state school supervision. They claim traditionally a high degree of obligation what concerns the orientations towards the general educational goals or the enacted teaching contents
- Curricula contain very generally held learning purpose formulations, a learning matters distribution plan (split on years) and informations about the teaching methodology
- Curricula are educational programs, didactical operation instructions, instruments of equal opportunities and aid for the teachers, in order to create their lessons.
- the current effective issue of the curriculum for bavarian elementary schools from the year 2001 tells us, that traditional and proven teaching forms should be complemented supplemental with individual work, work in pairs and in groups, forms of free practice, project oriented operation methods, differentiating and individualizing measures. Furthermore the teaching should be learner-centered.
- the curriculum doesn't state explicit any learning theory, but from what I've written above, you could abstract, that it claims a mixture of all theories named above. Moreover, it doesn't state which contents should be teached in a certain theory
- therefore teachers are allowed to be relatively flexible in using the theories.

4. Did the theories change or have teachers always been encouraged to teach a certain method?

a) ## In the U.S.

▸ Behaviorism used to be the dominant teaching theory. However, in more recent years, there has been a huge emphasis on constructivism. Constructivism has proven to be more effective for most lessons and subjects, however this does not mean that it is the best for all lessons and subjects. Research has shown that students learn better when they facilitate their own knowledge. As a result, during recent years, more emphasis is placed on the constructivists approach to learning. Teachers are seen more as facilitators who scaffold their students' learning. Students are expected to look to themselves and each other to come up the answers to the questions that are asked. It is the teacher's responsibility to make sure that the questions that are asked aren't simply 'recall' but require the student to think. See Bloom's Taxonomy.

▸ Other factors which influence how a teacher teaches are: the teachers' personal belief on how students learn, the location of the school; different school systems have different requirements for their teachers, and the federal and state government, the federal government tend to leave schools up to their own devices with a few exceptions i.e. The NO CHILD LEFT BEHIND ACT which requires teachers and states to be held more accountable for the success and failures of their students. The state government tends to be more hands on. Since funding usually has strings attached to them, it is up to the states to make sure that al the requirements that the federal government have are being met.

▸ In conclusion, it is safe to say that ultimately it is left up to teachers to decide what specific or combination of theories will be the most effective when teaching a particular subject.

b) In Germany

The methods of teaching that have been used in Germany have experienced a constant change, especially in the second half of the 20th century.

▸ **Cognition theoretical didactics** (1958):

Learning is seen as an active process of an individual, where he or she builds up knowledge through the active examination of the environment. Thereby learning is not only an accommodation of information, but the information is also always evaluated and processed by the individual. Hence everybody experiences the same information differently and builds up diverse knowledge. An important part of this teaching method is the well-balanced use of different types of media. That means books and videos as well as multimedia-based learning components.

▸ **Learning theoretical didactics** (1960):
Paul Heimann, Günter Otto and Wolfgang Schulze requested a close relationship of the theoretical and the practical parts of the teacher education. The teacher is seen as the "professional", who helps the students to maturity. The method is characterized by a value-free empirical-positivistic methodology. Teaching is a combination of intentions, methods and media.
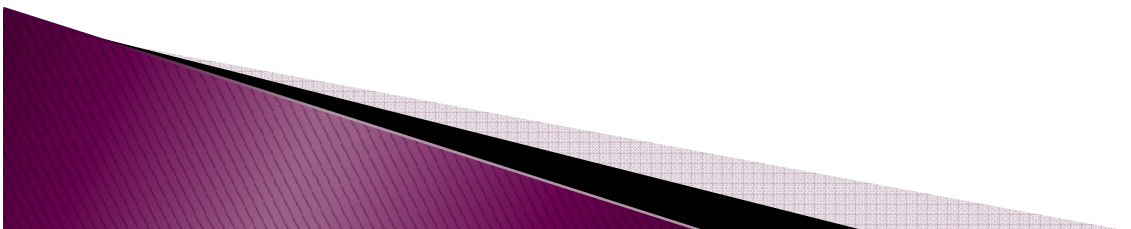
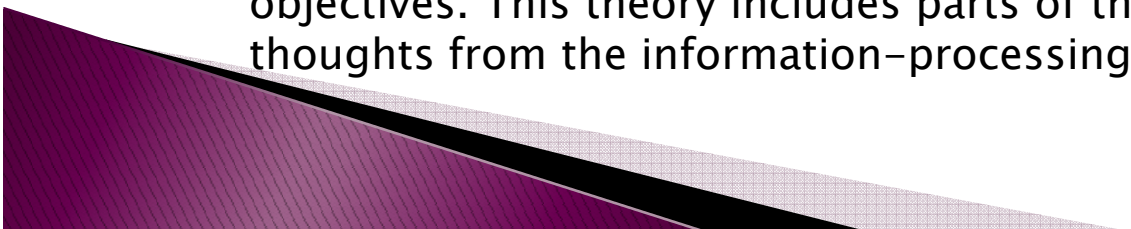- **Educational theoretical didactics** (1962):

  The main focus of this method had been on choosing the most adequate contents and topics for every class. Teaching this method meant presenting exemplary problems, through which the students were able to understand greater topics by generalizing it. Teachers were urged to do didactical analyses in which they had to evaluate the relevancy of the problem, its appropriateness as example, its structure, its meaning for the present etc. These analyses were supposed to help teachers find the most suitable exemplary problems.

- **Educational objective orientated didactics** (1965):

  The selection of educational objectives is of particular importance. By observing the students' final behavior, teachers can see whether the educational objectives have been understood. It is similar to the behaviorist's view of learning.

- **Information-processing-cybernetic didactics** (1970s):

  It requests a deliberate control of learning in order to reach all educational objectives. This theory includes parts of the cybernetic model as well as thoughts from the information-processing one.

▸ **Critical-communicative didactics** (1970s):

It demands a more student-centered way of teaching and learning and a raise of its relation to life. The concept is based on 11 axioms:

1. Permanence
2. Relationship
3. Determination
4. Economics
5. Organization
6. Anticipation
7. Rules and roles
8. Contents and relations
9. Control
10. Disruption
11. Method and end in itself

→ Parts of these didactics are still used today, but the three main theories behaviorism, information processing and constructivism have a much greater influence than the rest, especially the constructivist view.
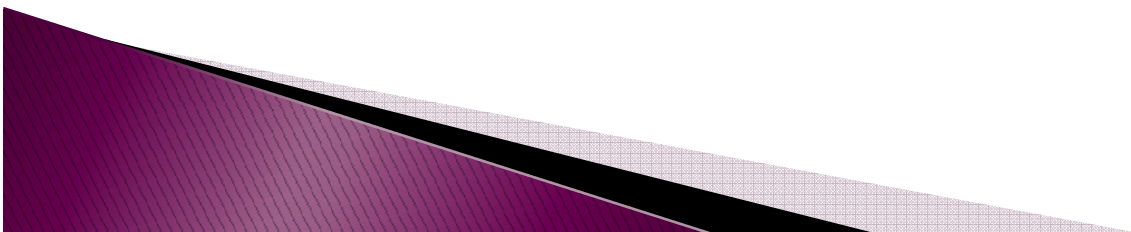
5. How are the theories taught to teacher education students?

a) ## In the U.S.

There are various approaches used to teach teacher education students about the different theories of learning that are used in classrooms. One way of teaching the theories is through the psychological aspect of it and those who have contributed through history to the benefits and drawbacks of teaching according to either of the theories. The ideas are presented by evaluating what may be effective towards students' learning and the different aspects of each. Teacher education students are also required to complete lesson plans and teach them in area schools. After doing so, you are asked to reflect on how the students responded to the lesson. Today, teacher education students are presented with the idea that the Constructivist approach is much more effective and engaging for students. On the other hand, we are also presented with the fact that there are times when the behaviorist approach is more appropriate and needed when teaching students straightforward facts.
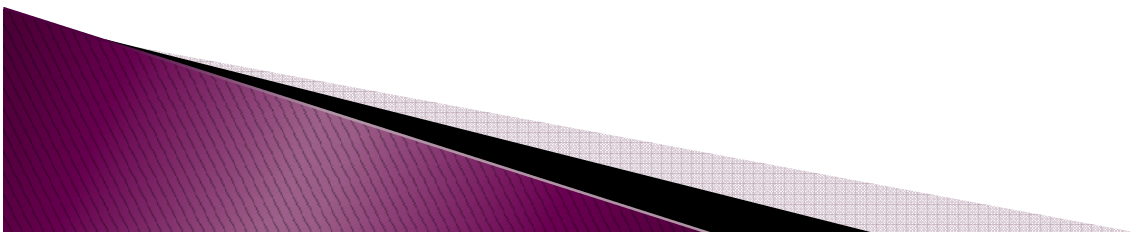
b) ## In Germany

Teacher education students are confronted with the learning theories in different classes during their course of studies. Various psychological classes deal with behaviorism including classic conditioning as well as operant conditioning, information-processing and constructivism. Numerous psychology classes inform about different aspects of the three theories and give a great deal of examples how they could be put into action in school. But the most recommended one is the constructivism. Students are urged to use more and more student-centered methods, to apply innovative ways of learning instead of the obsolete teacher-centered learning, mainly consisting of lectures by the teacher and very little active involvement of the students.
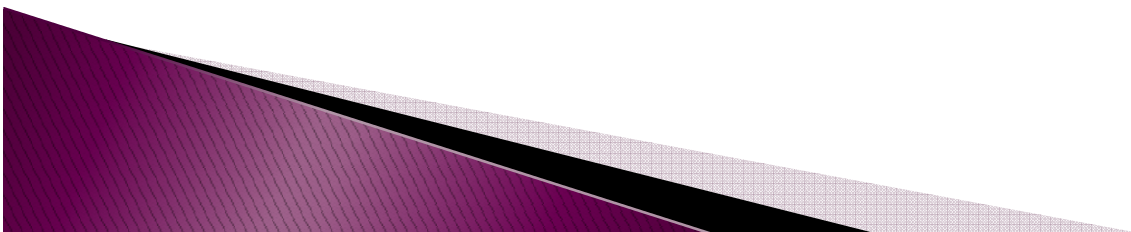
6. What types of instructions exist?

a) <u>teacher-centered approaches</u>

▸ teacher-centered approaches include instruction where the teacher's role is to present the information that is to be learned and to direct the learning process of students (Shuell, 1996)

▸ the teacher identifies the lesson objectives and takes the primary responsibility for guiding the instruction by explanation of the information and modeling. This is followed by student practice

▸ methods that fall into the teacher-centered approaches include demonstration, direct instruction, lecture and lecture-discussions
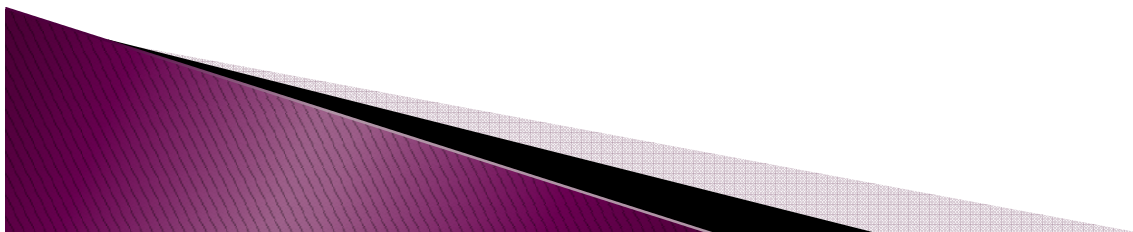
b) <u>learner-centered approaches</u>

- learner-centered approaches are grounded in constructivism and involve instruction where the teacher is a facilitator (or guide) as the learners construct their own understandings
- examples are: case studies, cooperative learning, discussion, discovery learning, graphic organizers, journals / blogs, KWL, learning centers, role-play, scaffolding, problem-based learning & inquiry learning, simulations and storytelling.

# 7. Examples of use for the types of instructions

a) **In the U.S.**

▶ **Teacher-centered Approaches:**

o **Presentation-** a presentation is where the teacher presents information to students. It is one-way and there is not interaction with the students. For example, In America many teachers use power-point presentations to present content to the students.

o **Demonstration-** in a demonstration the teacher shows students how to do a task or perform a procedure. For example, In America the teacher may demonstrate a science experiment in front of the class without the students doing anything themselves.

o **Drill-and-practice-** in drill and practice the teacher drills students on newly learned skills or to practice previously learned skills to enforce the skill. For example, In America, drill-and-practice is often used to reinforce math facts, such as addition and multiplication facts.
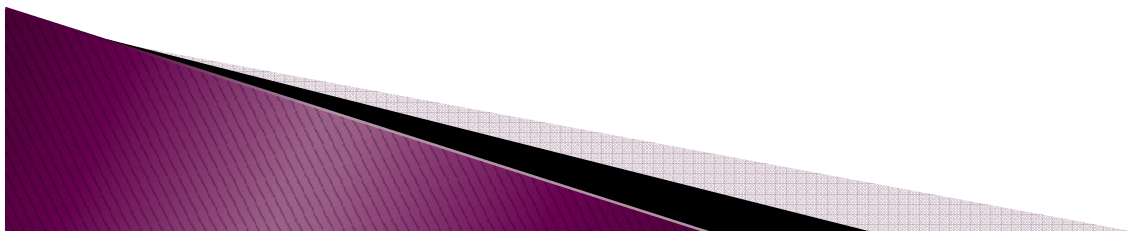
- ## Learner-Centered Approaches
    - o **Cooperative Learning**- in cooperative learning students work collaboratively toward a common goal or task. Tasks are shared equally among the group and groups should be heterogeneous.
    - o **Discovery**- discovery learning is when students learn through an inductive or inquiry approach in which students are encouraged and enabled to find answers for themselves. This lesson follows the 5E approach. Engage- gains students' interest in the topic but does not explicitly teach the topic. Explore- students aquire knowledge themselves, through questioning and experimenting. Explain- students explain their learning and the teacher provides guidance. Elaborate- students use the knowledge learned and apply it in a new context. Evaluate-teacher evaluates students learning.
    - o **Problem-solving**- students use previously learned content and skills to solve higher-thinking problems.
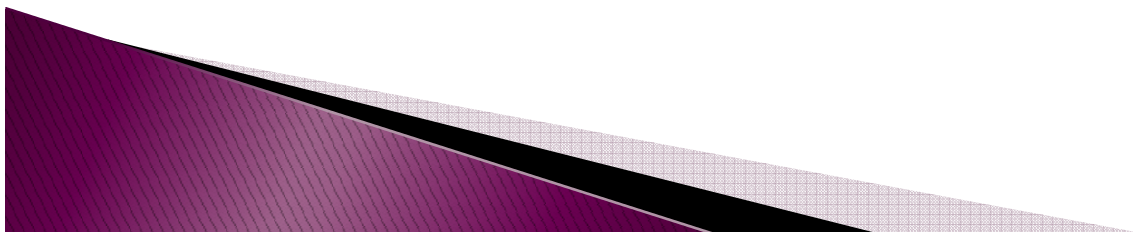
b) ## In Germany

▸ ## teacher-centered approaches

◦ **Demonstration**: Demonstration involves the teacher showing students a process or procedure such a science process, a cooking procedure or a computer procedure. Involving students in demonstrations allow this method to be less passive. -> Example: In German elementary schools exists a subject called "HSU" (Heimat-&-Sachunterricht = regional studies, basic sciences, local history and social studies). In this subject you do for example experiments on water, you can bring ice cubes and let them melt, you can broil water and let it boil away and so on. In all these processes you can involve the students.

◦ **Direct Instruction**: Direct Instruction is used to help students learn concepts and skills. There are various models of Direct Instruction but all include similar steps: 1) intro & review, 2) presentation of new information, 3) guided practice, 4) independent practice. -> Example: In the subject "german" the teacher puts some sentences on the blackboard and explains, that he wants to work on sentence structure with the students. Then he asks the students what they've already learned about the rules of syntax in the lessons before (intro&review). After this he explains new rules to them (presentation of new information) and does some exercises about this new topic in class (guided practice). As a homework the students have to work on some more exercises (independent practice).

learner-centered approaches

- **Journals**: Journals are often used in classrooms to allow students to record reflections and ideas. Typically written in a notebook and recorded each day, the journal serves as a method of communication between the student and the teacher. -> Example: In the subject "german" many teachers use reading-diarys. In this diaries, the students put information about the book they read at the moment (in class or at home), they write short summaries, draw pictures, make up little stories about the persons that appear in the book and so on. With this diaries, the teacher gets a general idea of what and how much every student is reading.

- **Role-play**: Role-play deals with solving problems through action. A problem is identified, acted out and discussed. The role-play process provides students with an opportunity to 1) explore their feelings, 2) gain insight about their attitudes, and 3) increase problem solving skills. -> Example: In Germany role-plays are used very often, in order to put oneself in the position of another person or to see topics from different perspectives. In the "german"-lesson curriculum is a sector called creative writing. The students could for example make up a dialogue that could have been between two characters who appear in a poem and then play it to the rest of the class.
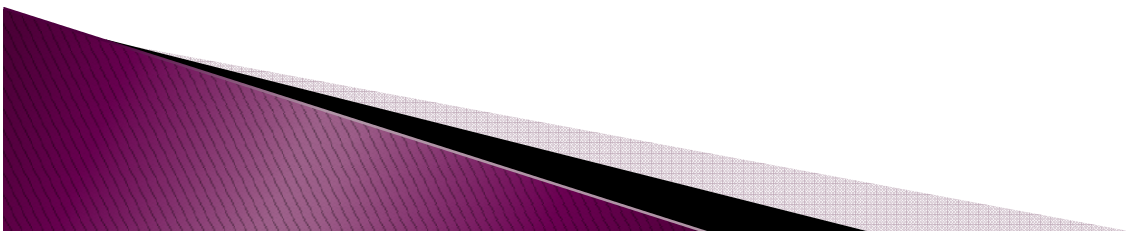
◦ **Learning by teaching**: Learning by teaching designates a method (created by Jean-Pol Martin) that allows students to prepare and to teach lessons, or parts of lessons. Learning by teaching should not be confused with presentations or lectures by students, as students not only convey a certain content, but also choose their own methods and didactic approaches in teaching classmates that subject. Neither should it be confused with tutoring, because the teacher has intensive control of, and gives support for, the learning process in learning by teaching as against other methods. -> Example: A student does a HSU – lesson about the egyptian culture, including reading out a text about it, creating sketches on the blackboard and doing excersises with the other students on this topic.
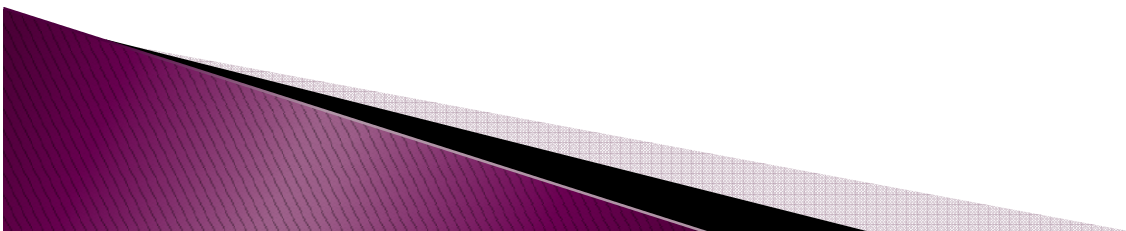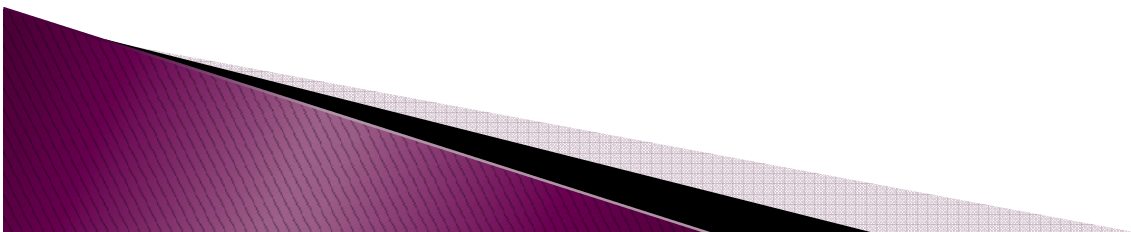
# 8. List of references

a) <u>used for the American part</u>

http://www.uky.edu/TASC/ED/inf_processing_theory.php

http://education.uncc.edu/lausband/3110fall08.htm   (PowerPoints from class)

b) used for the German part

- http://itc.utk.edu/~bobannon/in_strategies.html
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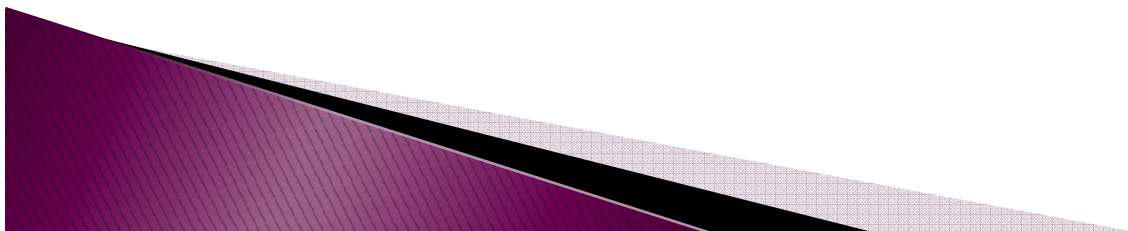
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