A Learning Theory Essay and a Micro-teaching Session

Learning Theory Essay

Psychological Theories of Learning and the Lesson Plan

All these theories concern the question: "How do people learn?" and therefore they must be incorporated into lesson planning.

Behaviourist psychology does not consider what actually happens in human mind. The essential forms of learning are visible stimulation and response, helped by repetition, reinforcement and conditioning.

Programmed learning (informed by behaviourism) suggests firstly an introduction on what exactly students should learn by the lesson's end; that the learning should progress in steps; feedback is given at each step; a contract of learning is negotiated to end with a reward and there are short term frequent immediate rewards to motivate learners.

Lesson planning involves reinforcement with frequent feedback on learning, delayed feedback allowing trial and error, and praise, marks and prizes. (Reece, Walker, 2000, 106)

Neobehaviourists modify core behaviourism because the human mind is selective in what it learns. The method adjusts to hierarchical learning behaviour in small upward steps (Gagne). It means entry level checking, connecting concepts together, and clear questioning to determine what students have (selectively) learnt (Reece, Walker, 2000, 107-108).

This general learning approach is associated with Pavlov, Watson, Thorndike, Skinner and Gagne.

For lesson planning teachers must think in detail and rationally: there should be clear objectives and assessment to match; a teacher should consider short tasks with frequent focused feedback for reinforcement with praise, marks and prizes.

However, in criticism, learning cannot be reduced to processes of conditioned reflexes, inputs and outputs. Behaviour observed is not the same thing as knowledge. Over-defined objectives can limit learning, and lead to triviality and criteria for learning in some subjects result from learning, in a more qualitative and dynamic relationship. (Reece, Walker, 2000, 107)

Cognitive psychology involves the internal processes of the mind in learning, arrangement of knowledge, understanding, motivation and retention.

Dewey saw it as learning to think itself. Bruner argued that teachers must teach how to think and analyse. Existing knowledge is used to check new knowledge, leading to transformation of held knowledge. Bruner called it "inquiry training". Ausubel believed that for such new knowledge to get into cognitive structures, students needed "advance organisers" to bridge from what they do know to what they must know next. In other words, new material needs describing before it can be accepted within a lesson. (Reece, Walker, 2000, 110)

There are still inputs and outputs but the focus is on the process. (Reece, Walker, 2000, 111)

In lesson plans it means seeing patterns within the subject material in order to prepare students for it. Students would have to make their own cognitive connections with the subject patterns. They can transform these subject patterns into their own cognitive understandings. This means lessons with plenty of self-discovery. Questions would to structure discussions, whilst letting students lead discussions. All the fresh insights and new meanings are to modify previous important understandings and develop each individual as a whole in a meaning life world (or culture).

Criticism is regarding how measurement can take place of what is happening - the inputs should still lead to teacher intended outputs.

Humanistic psychology is where learning and teaching focuses on relationships and values. Experience is already valid. It promotes intrinsic learning that rejects drilling and repetition. Learning is instead about broad life skills and wisdom. Humans have needs, from the simplest through to the most fulfilling (Maslow). In successful education, the inner being becomes harmonious with the external world. Education is spiritual and people are essentially good (and eager to learn). Knowledge can be beautiful (and people respond to beauty).

Teaching becomes facilitating because education relates to counselling and guidance to develop potential and insight. Education should be experiential in order to be successful and fulfilling. So the teacher should build a positive learning atmosphere, rely on students' motivations, and draw on the feelings of students. The teacher provides resources and learns along with the students, sharing their feelings. (Reece, Walker, 2000, 112-113)

The students participate in the design of the curriculum and even their attendance. The basics of learning, such as its environment, must be tackled first in a hierarchy of needs. Students work at their own speed and with much autonomy, rather as takes place at many ICT learning centres. (See Reece, Walker, 112-113)

Representative theorists are Dewey, Neill, Maslow and Rogers. Rogers pushed student centred learning by active self discovery - learning by doing - and not stimuli.

Criticism is that people are not so intrinsically good (motivation is not so forthcoming) and learning can end up being slow and limited.

In lesson planning it means building in students' choices and helping them manage

their own learning; the teacher sets up a positive learning environment and facilitates student activity. The teacher joins in as if a learner, there is provision of role-play and stimulation. In essence learning activities should develop attitudes and habits. (Reece, Walker, 2000, 113)

Kramlinger and Huberty (1990, quoted in Reece, Walker, 2001, 120) suggest that the humanistic perspective involves most why questions; the cognitive perspective asks what questions; whilst the behaviourist and some humanist perspectives ask how questions. Lesson plans should therefore include a combination of theories. Cognitive methods are preferred for the theoretical learner (an example being reading and noting down); behaviourist and humanist approaches are useful for pragmatists (using tasks and case studies); whereas humanist approaches are for reflective learners (for example, use of group discussion) (Kramlinger and Huberty, 1990, in Reece, Walker, 2001, 119).

Micro-teaching Session

Introduction

Key Skills has become a necessary feature of current education. Key Skills Numeracy and ICT at Level 3 are therefore part of training, as in the PGCE ITT PCE course.

My specialisation in Mathematics and ICT facilitates work for student teachers and their learning, as well as for education work for placement Mathematics students and their use of ICT.

Money Talk: Students Loans and Repayment was designed to engage the student teachers' interest because of the relevance of financial management.

The following teaching methods and group activities support the lesson aims and learning outcomes in my Microteaching session (look at the Scheme of Work and Lesson plan on the next pages):

SCHOOL OF EDUCATION AND CONTINUING STUDIES

LESSON PLAN

Name of teacher: Dr Elena Worsfold Course: PGCE ITT FE Subject/topic: GCSE Mathematics/ Compound Interest and Repayment of student Loan	
Date: 21/10/2005 Start time: 9:45	Location: Burnaby Building 1.26 Duration: 30 min

Lesson aims:

1. Calculation of compound interest using step by step and formula methods
2. Working out student loan repayment scheme regarding expected earnings

Learning outcomes:

1. Calculate percentages on the amount
2. Work out interest received on invested money using compound interest approach/formula
3. Calculate and demonstrate the rise of interest on the loan depending on time
4. Discuss/work out student loan repayment scheme based on expected teachers salary

Content of the session:

1. Introduction: numbers and money in our world, Key Skills Numeracy and PGCE Course
2. Interactive white board presentation on compound interest/handouts
3. Working in pairs/groups on compound interest exercises
4. Interactive white board presentation on students loans repayment/handouts
5. Working in pairs/groups on loan repayment exercise

Teaching methods:

1. Commence the session with general discussion on money/numbers problems in our everyday life and level of Key Skills Numeracy covered in the course
2. Deliver Internet presentation discussing with the group working examples
3. Work in groups – compound interest on loans exercise
4. Discuss/work in groups – loan repayment

Resources required:

Whiteboard, Computer, Software, Handouts, Calculators

Key Skills covered in this lesson:

1. Key skills Numeracy Level 2 – percentages, decimals, rounding up, powers, formula usage, money

2. Key Skills ICT Level 2 – Microsoft Word, Spreadsheets, Internet

Recommended reading and web-sites:

1. Metcalf, P. (1998) *Mathematics GCSE: Key stage 4,* Collins Educational
2. Pledger, K. and Kent, D. (1997) *Revise for London GCSE: Intermediate,* Heinemann Educational Publishers
3. www.slc.co.uk – Student Loans Company Web-site

Money talk:

Compound Interest and Repayment of Student Loan

People can save money by putting it in a deposit account or a savings account in a bank or building society. They receive a payment called interest. Interest is paid at a certain percent per year.

Example 1*:* 5% interest on £1000 savings.

Method: 1000 x 5/100 = 5 x 10 = 50 = £50 interest at the end of the year

• If you withdraw the interest and leave the savings (called the principal) in the account you will earn another £50 in the second year – total £100.

• After three years at £50 each year the interest totals **£150**.

• This way of payment, when the interest paid is not invested, is called simple interest.

• With compound interest, the amount of interest paid is reinvested and earns interest itself.

• In compound interest, the principal changes every year, as the previous year interest is added into it.

Example 2:

£1000 is invested at 5% per annum compound interest. What is the amount after 3 years and what is total interest received in 3 years?

Year 1. Interest (I) = 1000 * 5 / 100 = £50

Total amount (A) at the account at the end of Year 1 is

A1 = 1000 + 50 = £1050

Year 2. I = 1050 * 5 / 100 = £52.50

Total amount (A) at the account at the end of Year 2 is

A2 = 1050 + 52.50 = £1102.50

Year 3. I = 1102.50 * 5 / 100 = £55.125

Total amount (A) at the account at the end of Year 3 is

A3 = 1102.50 + 55.125 = £1157.625 = **£1157.63** (to the nearest penny).

The amount of compound interest got is:

I = 1157.63 – 1000 = **£157.63**

The formula for compound interest is:

$$A = P \times \left(1 + \frac{R}{100}\right)^{T}$$

where:

A = total amount

P = original investment (principal)

R = rate % per annum

T = time in years

Using this formula for Example 2:

P = original investment (principal) = 1000

R = rate % per annum = 5

T = time in years = 3

A = $1000 \left(1 + \frac{5}{100}\right)^{3}$ = 1000 x 1.053 **= £1157.63** (as before).

Comparing the results of examples 1 and 2 we can see that at the same given conditions – principal, rate and number of years - amount of compound interest is bigger.

Loans and Repayment

'Loans taken out by students who entered higher education for the first time, on or after 1 September 1998, will repay their loans on an income contingent basis. That is, the amount to repay will be related to income. The rules on repayment are defined by government regulations which may be subject to change from time to time.

You will normally start making repayments in the April after you have graduated or stopped attending your course, assuming that your income is over £1,250 per month, (£288 per week or £15,000 per annum threshold). The interest rate is linked to the rate of inflation. The interest rate from 1st September 2005 will be 3.2%. Interest accrues from the day you receive the first installment of your loan. Those over the threshold will have to pay 9% of the income which is above the threshold. No income that you might have had before the start date will be taken into account in calculating your repayments. Repayments will be stopped when a person reaches retirement '. www.slc.co.uk

Here are 3 estimated examples based on total gross income for the year:-

	Example 1	**Example 2**	**Example 3**
Total Income to be assessed	£13,000	£18,000	£21,000
Less threshold	£15,000	£15,000	£15,000
Net income which repayments are based	Nil	£3,000	£6,000
Deductions at 9%	**Nil**	**£270**	**£540**

Exercise 1: The standard student loan is £4195 per year of study. Calculate how much will a student owe in 4 years after the graduation if the loan is not repaid back taking the annual inflation rate as 4%. Use either the formula or year by year calculations.

Exercise 2: The standard student loan is £4195 per year of study. Work out how much will a student owe when the pension age is reached taking the annual inflation rate as 4% if the loan is not repaid back.

Exercise 3: Depending on how much are the teachers' salary and the inflation rate are likely to be over the next years work out how many years will it take someone to repay a one year student loan.

Answers

Money talk:

Compound Interest and Repayment of Student Loan

Exercise 1: The standard student loan is £4195 per year of study. Calculate how much will a student owe in 4 years after the graduation if the loan is not repaid back, taking the annual inflation rate as 4%. Use either the formula or year by year calculations.

Using formula:

$$A = P \times \left(1 + \frac{R}{100}\right)^T$$

P = original investment (principal) = 4195

R = rate % per annum = 4

T = time in years = 4

$$\mathbf{A} = 4195 \times \left(1 + \frac{4}{100}\right)^4 = 4195 \times (1 + 0.04)^4 = 4195 \times 1.04^4 = 4195 \times 1.1698 = \mathbf{£4907.56}$$

Year by year calculations:

Student loan after the1st year (even before student starts to repay it):

Interest on the loan after the 1st year:

Interest1 = 4195 x 4 / 100 = 167.8

Loan1 = Original Amount + Interest1 = 4165 + 167.8 = £4362.80

Interest on the loan after the 2nd year:

Interest2 = 4362.8 x 4 / 100 = 174.51

Loan2 = Loan1 + Interest2 = 4362.80 + 174.51 = £4537.31

Interest on the loan after the 3rd year:

Interest3 = 4537.31 x 4 / 100 = 181.49

Loan3 = Loan2 + Interest3 = 4537.31 + 181.49 = £4718.80

Interest on the loan after the 4th year:

Interest4 = 4718.80 x 4 / 100 = 188.75

Loan4 = Loan3 + Interest4= 4718.80 + 188.75 = **£4907.55**

Exercise 2: The standard student loan is £4195 per year of study. Work out how much will a student owe when the pension age is reached taking the annual inflation rate as 4% if the loan is not repaid back.

Using formula:

P = original investment (principal) = 4195

R = rate % per annum = 4

T = time in years = 10, 15, 20, 25. 30, 35, 40

$A = 4195 \times (1 + \frac{4}{100})^{25} = 4195 \times (1 + 0.04)^{25} = 4195 \times 1.04^{25} = 4195 \times 2.6658 =$

= £11,183.18

MONEY TALK				
(MINE ALWAYS SAY, 'GOOD BYE!')				
INITIAL AMOUNT (Principal)	NUMBER OF YEARS TILL PENSION AGE (time)	INFLATION RATE PER YEAR	INITIAL AMOUNT INCREASED BY (1+rate/100)^time	MONEY OWED AT PENSION AGE
4195	10	0.04	1.4802	£6,209.62
4195	15	0.04	1.8009	£7,554.96
4195	20	0.04	2.1911	£9,191.76
4195	25	0.04	2.6658	£11,183.18
4195	30	0.04	3.2434	£13,606.05
4195	35	0.04	3.9461	£16,553.84
4195	40	0.04	4.8010	£20,140.28

Exercise 3: Depending on how much the teachers' salary and the inflation rate are likely to be over the next years, work out how many years will it take someone to repay a one year student loan.

Student loan after the1st year (even before student starts to repay it):
Current inflation rate from 1 September 2005 is 3.2%.
Loan1 = 4165 + 4195 x 3.2 / 100 = £4329.24
Teachers Starting Salary =£19,000
Amount assessed for loan repayment = Teacher's Salary – Threshold £15,000 =
=19000 – 15000 = 4000
Money to pay = 9% of £4000 = 4000 * 9 / 100 = 360
Remaining debt at the end of the 1st year: 4329.24 – 360 = 3969.24 etc

MONEY TALK

STUDENT LOAN REPAYMENT

NUMBER OF YEARS	1	2	3	4	5	6	7
MONEY OWED AT THE BEGINNING OF THE YEAR	4195.00	3969.24	3646.26	3132.94	2513.19	1783.61	940.69
INTEREST RATE, %	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
YEAR INTEREST	134.24	127.02	116.68	100.25	80.42	57.08	30.10
MONEY OWED AT THE END OF THE YEAR	4329.24	4096.26	3762.94	3233.19	2593.61	1840.69	970.79
TEACHERS SALARY	19000	20000	22000	23000	24000	25000	26000
TEACHERS' SALARY MINUS THRESHOLD 15,000	4000	5000	7000	8000	9000	10000	11000
MONEY TO PAY	360	450	630	720	810	900	990
REMAINING DEBT	3969.24	3646.26	3132.94	2513.19	1783.61	940.69	-19.21

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