OUTSTANDING TEACHING, LEARNING AND ASSESSMENT
TECHNICAL SKILLS
NATIONAL PROGRAMME

Lakes College West Cumbria
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To young people, recognising and managing financial decisions is almost impossible. This report looks at what influences decision making and asks can experiential learning be used to support, enhance and engage math learning at the same time?
Experiential Learning

What does it mean to learn using experiential methods? According to the Merriam-Webster dictionary, experiential means ‘to provide experience with or direct observation of.’ So, experiential methods for math instruction must refer to teaching math to students by allowing them to experience the math.

This allowed me to think, but what does it mean to 'experience the math'? To experience is to do and see things, or to have things happen to you. Therefore, experiential methods for math instruction are methods that allow students 'to do', and 'to see' and 'to have things happen to them'

In math; I should make the students active participants in the process of learning. To engage them by increasing their physical activity level when learning a new concept, with real life finance skills so that students could internalize the information and be more supported in the concepts. The more they can 'do' while learning, the better.

Introduction

The objective of this study is to prepare students to manage their money on a day to day basis and plan for future financial needs. How to make informed choices and be ambitious, to learn about the economic environment and how personal financial choices can affect oneself and others. The key question was will this engage learners and have a positive effect on attendance and achievement?

I write from the perspective of 10-years teaching math in an FE college, including many attempts at innovative curriculum development and incorporation of technology into the learning environment. My teaching journey in FE began through reading research journals and cognitive psychology books but for the most part it has been through experiential learning and having a growth mind set. This learning process has been the most powerful and enriching to both myself and the students to date.
Methodology

During the academic year 2017/18 there was a sharp decline in achievement and major concerns with Functional Skills math. The achievement rates for FS math full time learners aged 16-19 were very low at 26.6%, overall significantly down from 53.3% a year earlier. This was due to many factors that have been addressed in the SAR. However, the decision to analyse this area of provision was decided upon to see if a significant improvement could be made to this cohort of learners using the experiential learning model.

Data Enrolments 17/18

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Data Enrolments 18/19

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<tr>
<td><strong>Total</strong></td>
<td><strong>158</strong></td>
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When considering ways to incorporate experiential learning in a controlled manner to this cohort of 158 learners it was decided that there would be 8 controlled groups, 7 taught by one tutor and an uncontrolled group. The remaining lower entry groups would also be uncontrolled, due to profound needs. A seven-week scheme of work was designed and taught to the controlled group and the remaining groups were taught the traditional curriculum, with ‘abstract’ teaching methods.

These groups would be carefully analysed from a starting point and compared. Controlled groups would be taught the experiential model - teaching about taxation, NI, cost of living, finance, savings and making choices and be concluded with the budget embedding Fundamental British values.

The learning environment was considered all learners taught a 90-min session a week plus all groups would have an extra session a week (LRC Session)
This would be independent study which is student focused, one might hypothesize that “they are paying more attention to what they are doing because it is a personally chosen activity during those times when they are free to make their own choices. By offering activities that support mathematical foundations, teachers can give students more experiential exposure to mathematical concepts outside of formal instruction time.”

Analysis

The analysis of the learning is quite extraordinary. Sadly after 3 weeks the controlled group that tutor 2 taught withdrew from the project. The feedback was that the learners (although engaged) had poor behaviour issues and found the level of learning too high. She decided to return to the traditional curriculum as although a highly experienced tutor she is new to the subject area.

Total learners in the controlled group 85 Level 1, 7 Entry 3 and 10 Level 2 math apprentices that are employed 2 are over 19. Total learners - 102 in project These learners all completed the project.

The sessions were all planned carefully around the ELM lesson plan in line with the objectives in mind.

All learners undertook an initial assessment, non-calculator assessment and autobiography about their math history. This enabled a profile of individuals and group characteristics to be built for both controlled and un-controlled groups.

It was decided by the tutor at this point not to tell the groups that they would be part of a controlled project. The growth mindset was set from the start with expectations and the scheme of work for the half term briefly. In most cases - students were puzzled by the topics but were almost relieved that it was something different from the “same old math”- that 88% did not like at all.

After undertaking the Initial assessment, the report showed that only 3 learners were currently reaching level 1 math. The cohort broke down as
Math history profiles of learners became extremely valuable all learners have failed in math exams - some many times. Their confidence is rock bottom. 35% commented on a mix of teachers and many different teaching styles. 19% were put in front of a text book or non-math specialist. 38% admitted they behaved badly to get thrown out because they hated math that much or they skipped lessons. 12% came from a PRU or were home schooled and were anxious about being in a classroom. 96% said they were bad at math and thought they would fail again and 78% thought that math was not relevant to life or to them.

Some learners did have good teaching and just struggled but the majority had a very negative view of a beautiful subject.

After completing the initial assessments all learners undertook a diagnostic assessment at the level they needed to achieve.

The mean score for the controlled group after the working level was set at Level 1 was 27.38%. There was not a significant difference between the cohort’s other than the Arabic speaking learners scored lower in all cases. SEN students however, generally scored above the average at 37% and the uncontrolled group was similar.

All 124 Level 1 and 12 of the Entry were timetabled across 9 math sessions throughout the week for 90 minutes long each. 7 groups were part of the ELM project and taught by the same tutor. The groups were as follows:

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**Initial Assessment results**

- Entry 1: 52%
- Entry 2: 13%
- Entry 3: 4%
- Level 1: 29%
- Pre-entry: 2%

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Cohort A
8 Level 1 math
1 Entry 3 math
4 Level 2 apprentice math
1 Entry 3 apprentice math
2 females and 2 male Arabic refugees
Vocations - H & SC, Motor Vehicle, Construction, Engineering

Cohort B
1 Entry 3 math
11 Level 1 math
1 male and 11 females
Vocations - Hair, Beauty and H&SC

Cohort C
12 Level 1 math
5 females, 7 males, 1 SEN
Vocations - Catering, Motor Vehicle, Engineering, Childcare, Construction.

Cohort D
12 level 1 math
1 Entry 3 math
6 level 2 apprentice math
11 females, 8 males, 3 SEN
Vocations - Art. Photography, Hair, Beauty, Catering and Electrical.

Cohort E
16 level 1 math
All male
Behaviour issues and SEN

Vocations – Plumbing, Construction and Sport.

**Cohort F**

12 Level 1 math

1 Entry 1 math – Arabic speaking

7 females, 6 males, 1 SEN

Vocations – Public Services, Childcare, Hair, Engineering, Construction, Digital Technologies.

**Cohort G**

14 Level 1 math

2 Entry 3 math

1 female and 14 males

Vocations – Art, Hairdressing, Engineering, Brickwork, P&D and Plumbing.

2 SEN

**Sessions**

The sessions were all planned carefully around the ELM lesson plan, in line with the objectives in mind. All lessons met the criteria - more than I could have imagined. There was a real discovery, many experiential moments as detailed in the reflections, from the topics of taxation, to the comparing of loan rates and looking at different types of finance.

A significant number of learners had never really thought about tax and did not now you had to pay it or how much it was. Only 8% of students had heard of a personal allowance and understood this.

The learners were engaged in this topic as most learners are aiming for a career in a vocation. Some have part time jobs - this was explored as to why tax is not paid, emergency tax, p60/p45 etc. The ESOL learners found this extremely useful in a very practical sense and some learners were taking photos of the screen and this was a math lesson! Math was being embedded from all angles and yet the learners were not aware. Thy were saying, “thank you, I enjoyed this session”
Independent tasks were set to find a job that they would like to apply for in the future and note the annual/monthly salary and find somewhere they would ideally like to buy/rent as a first home this allowed learners, to link what we had been learning to their real world.

From a negative point of view, it was at this point that the realisation that many students could not tell the time and a small number had no skills in working with money and coins became apparent. In a positive way, these learners were building confidence able to admit for the first time that these were real problems - that they had always wanted to overcome. This had an impact on the intervention and the limitations for those whom had money skills gaps.

The cost of living was the most powerful session - beforehand most learners estimated the cost of having their own home, dreamed of moving out and having a nice car and then through discovery and ELM they had a realisation about bills and rent and at the end 66.8% of learners no longer wanted to move out of home anymore and their choice of car had changed.

Without a doubt, the lesson that the learners remembered and enjoyed the most would be the loans and finance, as they were all flabbergasted at Wonga loans and how much interest you pay back. Definitely a thought for the future about debt. The most engaging task from the learner’s perspective was the inflation task and what things cost in 1972? Without planning - many of our sessions have developed into history sessions about decimalisation and allowed even quieter learners to debate and ask why we have sugar tax? Fundamental British Values is often hard to embed within maths. However, within this topic it provides itself naturally.

All learners sat an exam board mock assessment, covering all the key aspects of tax, national insurance and problem solving. 81% achieved at least 70% in this assessment.

Results overall

2 over 19, Level 2 apprentices passed after the intervention in the first exam sitting and 9 full time learners passed at the last stage of the intervention. Another 16 learners are due to sit in the new year.

The achievement rate at present, after this intervention is currently 28.8% 2.2% higher than last year already, learners from the uncontrolled groups are not included in this data, as they were not ready to sit an examination at this stage.

Cohort D, gave the most positive feedback and enjoyed the ELM more than any other group, especially the art vocational area. Every learner had excellent attendance and completed the independent work - interestingly this has the learners that struggle academically.
Cohort E, gave the least positive feedback and enjoyed it the least this cohort had extreme behaviour problems and SEN issues - the cohort completed the project but not all learners completed all tasks and although attendance was good, progress for the most of this group was not as high as the rest of the groups. I believe this is because there was maybe too much challenge causing engagement to drop and cease.

Cohort A, has progressed academically faster than any others - this is the only group with over 19 learners in and although ESOL learners present a different challenge in math learning, in this learning process it supported the learners and paid dividends in many ways for them. The group have a tight bond, their English speaking has progressed and half of the achievement rates so far have come from this cohort.

Lastly, Cohort B had the poorest attendance almost 35% lower than other cohorts. This was because of a lot of social and emotional problems within the Hair & Beauty area. The learners engaged in the project but although made progress still had confidence issues with math in many cases.

The uncontrolled groups had poorer attendance overall than the controlled groups.

LRC sessions
Each learner was timetabled an extra 90 minutes a week for math. This was supervised by a HLTA and coordinated by the tutor with a RAG system. Attendance in the controlled group was significantly higher than the uncontrolled groups.

Initially there was some resilience to attending these sessions but once learners became engaged and they realized they were not teacher led and very independent and student focused using manipulatives, and ICT this has continued to improve attendance.

Conclusion
The purpose of study in the mathematics programmed clearly states that it is necessary to prepare students to be financially literate.

The curriculum for mathematics aims, states that “students should apply their knowledge, interpret and solve problems in financial contexts”

Beyond the math syllabus there is a statutory citizenship programmed that all KS3/4 students should be able to manage their money on a day to day basis and plan for future financial needs.
97% of my cohort said that they gained significant knowledge from this intervention/project.

66.8% of them no longer want to leave home as they realize the cost of living.

As a contraindication of this experiential learning it is known that 31.2% of math learning have difficulty telling the time, this has enabled a time intervention workshop to be set up for these learners.

Pass rates are already increased by 2.2% from 26.6% last year in FS math. This experiential learning without a doubt has had a big impact on this increase.

All learners attempted the assessment and working out and problem solving has improved by using this model, although not always correct. In most cases students maintained interest, learned successfully, and completed their tasks.

The decision to keep the learners from knowing that they are part of a project was significant as

“When interest is internal, as opposed to being forced, students become both emotionally and intellectually invested in the learning process”

I will continue to use this model in maths and develop this financial topic in the future for all learners and believe it pays dividends both socially and in their math education and learners agree, that these are valuable skills in life to learn and more interesting than standard math.