

Summary of Feedback Exercise

In this document I'll describe the results of a brief feedback exercise undertaken after the teaching of my portion of the MAT001 course.

The main results are positive. It seems that most students engaged with the teaching materials I presented to them. There does not seem to be a major shift of behaviour amongst the various self declared learning styles. Despite the positives there is still scope to encourage students to use the various resources in particular by incentivising their use.

Summary of questions

At the end of the 4 week of teaching undertaken for the MAT001 course I asked students to fill in a feedback form. I taught this course encouraging students to look at as much content as possible prior to the lecture. In particular I shared all my teaching resources prior to the lectures and also pointed the students towards various other resources such as videos, articles and Sage worksheets.

The feedback exercise asked the following questions:

- What type of learner would you consider yourself to be?
 - Convergers are characterized by abstract conceptualization and active experimentation. They are good at making practical applications of ideas and using deductive reasoning to solve problems.
 - Assimilators are characterized by abstract conceptualization and reflective observation. They are capable of creating theoretical models by means of inductive reasoning.
 - Accommodators use concrete experience and active experimentation. They are good at actively engaging with the world and actually doing things instead of merely reading about and studying them.
 - Divergers tend toward concrete experience and reflective observation. They are imaginative and are good at coming up with ideas and seeing things from different perspectives.
- Did you find the teaching materials easy to access?
- Did you find the teaching materials easy to read?
- Did you watch any videos made available to you before a lecture on a particular subject?
- Did you watch any videos available to you after a lecture on a particular subject?

- Did you find the use of a mathematics computer package (Sage) useful in the lab session?
- Did you use a mathematics computer package (Sage) whilst working away from class?
- Did you look at any of my posts on G+ relevant to MAT001?
- What parts of the first 4 week of MAT001 did you find troublesome?
- What parts of the first 4 week of MAT001 where you most motivated to do well in?

I also asked the student to offer any qualitative feedback as well. These are listed in the accompanying documents.

Initial Results

Learner Types

Interestingly, the distribution of Patient types in my class seems to be rather dominated by *Convergers* (9) and *Accomodators* (10) more than 70% of the class.

Indeed only 1 of the students considered themselves to be a *Diverger*, 4 responded *Assimilators* and 3 did not choose any patient type. This seems to indicate that most of the students like to learn through active experimentation.

Quality of Lecture Material

Generally students felt the material was easy to access (89%) and there was also a high number of students (82%) that felt the notes were easy to read. One student kindly wrote:

“Really easy to access notes using the website.”

Having said both of the above it seems that some students did find certain notes difficult to read:

“I found the notes particularly hard to read but I guess that was due to my non-mathematical background.”

This seems due more to the content (various efforts by myself and others are already in place with regards to non mathematical backgrounds) as opposed to issues of inclusivity (no particular comments were made with regards to the content of the course). Note that these results seemed relatively uniform accross

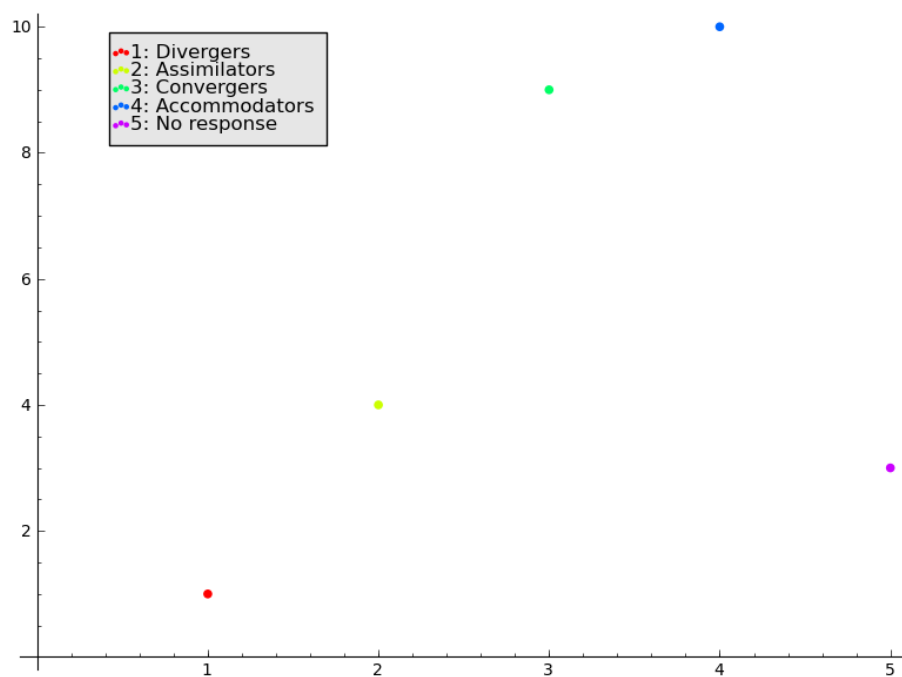


Figure 1: learner_types

learning styles (the negative responses were made by the Accomodators and Converggers which due to the sample size is expected).

I'm relatively content with the feedback recieved regarding delivery of the course, I will nonetheless preempt issues of inclusivity by adopting a universal note creation methodology involving pandoc in the future.

Use of videos pre and post lectures.

Videos were made available to students before and after lectures. A large majority of students seemed to have watched the videos prior to the lectures: 70%. This behaviour seems to be relatively uniform accross the various learner types:

“The videos were helpful as you could go through explanations multiple times at your own pace to fully understand the methods.”

This behaviour is however not the same with regards to viewing videos **after** the lecture. Indeed, only 56% of students watched the videos after a lecture. Furthermore there seems to be a slight difference (not statistically significant) between the various learner types:

- *Accomodators* seem to follow the general trend: 50%.
- A lot of *Converggers* watched video after the lecture: 78%
- None of the *Assimilators* watched any videos after the lecture.

Whether or not the above is representative of learner types is an interesting question.

One of the comments with regards to viewing videos after the lectures was dissapointed by the length of these:

“I expected the videos to be a bit shorter, which is why I didn't go back and rewatch them after the lecture.”

Some of the videos that were targeted as “to view post lecture” were actually videos of research talks (>20 mins). Perhaps this explains the concern about the length by this particular student.

I feel that this area is the one that could be improved. I plan to improve the overall quality of videos as well as design my teaching in student lead ways. This could imply that students make a great use of the videos and other resources available to them (or indeed that they would/could find much better ones!)

In particular some students felt that the notes were not clear enough:

“It was difficult for me to go through the notes before the lectures. More descriptive wordings are needed. I would never feel disturbed if there are too much explanations and I would like to know all of it.”

I think that by emphasising an enquiry based approach as well as a bespoke classroom students will understand that the point of lecture time is to clarify things that are not obvious in the notes etc...

The use of Sage

The open source mathematics package [Sage](#) is used throughout this course. I use it during my the lectures, in various videos I have created and encourage students to use it during lab sessions as well as on their own.

The feedback regarding Sage was mixed: 63% of students found using it during the lab sessions helpful. This was relatively consistant accross the various learner types. Sage was not explicitly taught to the students (I did not want to alienate students with ‘yet another thing to learn’) but most students seemed to want a bit more of a formal introduction to the software package:

“Maybe could have explained a little about the code writing for Sage in the labs sessions, so can then use it to answer/help with other questions we are set.”

“Was hard to use Sage outside of tutorials and weren’t taught in much detail on how to write the code in Sage other than what was explained in the tutorial sheets”

I will aim to create resources that allow for a better learning/use of Sage by students on their own.

With regards to using Sage in non-contact time, the results were less promising, only 30% of students used Sage on their own. This is perhaps not that low a percentage based on the above remarks. Sage is indeed meant as an extra tool and so it is perhaps not useful to many students. Indeed 50% of *Assimilators* used Sage in non contact time whilst other learner types were more in line with the general trend of 30%.

The main emphasis will be put on creating resources for the students to enable them to use Sage.

Using Google Plus

I use Google Plus extensively as a research, innovation and engagement tool: sharing my research and general networking with individuals in my field (and

other fields!). I extended the use of Google Plus to my teaching in this course, often posting with the “#mat2012” hashtag to emphasise things that might be of interest to students. My choice of the Google plus over other social networks is due to the underlying topology of these networks. This worked quite well as I even had some conversations with students on the Social Network. Just under 63% of students viewed my posts on Google Plus, I’m very satisfied with this number as I did not make the use of Google Plus a ‘big deal’. This seemed relatively uniform over all learner types but perhaps Accomodators seemed to engage less (40%) with Google Plus.

Some students seemed quite happy with Google Plus:

“promote the G+ page more”

Whilst dissapointingly a student thought he/she needed to join Google Pus to use view the content I was sharing (one of the main points of G+ is that you do not need to join to view posts, I did try to make this clear and as only a single student mentioned this I don’t think it’s too big a concern):

I didn’t look at the G+ posts because I’m not on G+!

Continuous development of Google Plus have lead to the creation of “communities”, I plan on using communitites in my next course as well as to continue post in the way I am used to.

Particular Subjects

Troublesome Subjects: In general ‘Reliability Theory’ seemed to be quite troublesome for students. Interestingly this is also the subject that has the least non contact resources.

Here is a list ranking the subjects (1. indicated as troublesome by the most students):

1. ‘Reliability Theory’: 15
2. ‘Queueing Theory’: 10
3. ‘Inventory Theory’: 8
4. ‘Decision Analysis’: 4
5. ‘Markov Chains’: 3
6. ‘Project Management’: 2
7. ‘Game Theory’: 2
8. ‘No Response’: 1

Motivating Subjects: Two of the most motivating subjects were ‘Game Theory’ and ‘Markov Chains’, these subjects were taught in a very interactive way with a wealth of non contact resources available to the students (1. indicated as motivating by the most students):

1. ‘Markov Chains’: 16
2. ‘Game Theory’: 15
3. ‘Queueing Theory’: 12
4. ‘Project Management’: 11
5. ‘Reliability Theory’: 10
6. ‘Inventory Theory’: 8
7. ‘Decision Analysis’: 8

Summary and Conclusions

In general I am quite satisfied with the level of engagement shown by my students with the various out of contact resources made available to them. Having said this I feel that I need to make these resources take a greater place in my teaching. I will furthermore concentrate even more on a student led approach: in particular by adopting an IBL approach to my teaching. The fact that students in general were more motivated to succeed in lessons that involved a greater level of engagement seems to motivate this.

My teaching will involve a large number of out of contact resources (flipped classroom) with contact time devoted to student presentations (IBL approach).