Does the provision of an 'own working space' for tutors enhance the learning experience for students (when implementing an extensive module level tutorial timetable)?

Final project report for eSTEeM project

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Executive summary

In response to the group tuition policy (GTP), on M303 we designed a comprehensive list of about 60 tutor-led cluster-level tutorials to replace the standard 7 tutorials per group in a cost neutral way. However, GTP implementation at the university level turned out to be challenging and the policy became unpopular among tutors due to concerns about the tutor-student relationship, complicated timetabling, and logistical issues associated with shared online rooms.

To address tutor well-being and timetable practicality on M303, we gave each of our tutors an individual, personal teaching room that was accessible to the whole student cohort.

This study employs Roger's Diffusion of Innovation and Davis's Technology Acceptance Model to analyse the adoption of the GTP by M303 tutors and explain how the use of individual, personal rooms may mitigate the potential negative impact on tutor well-being of changes in tuition strategy.

We surveyed tutors on M303 and analysed student engagement with tutorials across two presentations to see whether using personal teaching rooms improved tutor well-being, student satisfaction and tutorial engagement.

The results show that implementing the GTP with individual, personal rooms had a greater relative advantage over the previous system than implementing the GTP with shared rooms; that using individual, personal rooms with the GTP increased the compatibility with existing values, was less complex and more trialable than the GTP implemented with shared rooms; and that the perceived usefulness of the GTP with individual, personal rooms was higher than that of the GTP with shared rooms. The timetable facilitated by using individual, personal rooms appeared to raise student satisfaction and increase tutorial engagement.

Contents

Aims and scope of the project

M303, *Further Pure Mathematics*, is a 60-credit module that covers numerous topics in pure mathematics and few tutors are expert in all of them. Insecurity in their knowledge can result in tutors taking a more teacher-focused approach that is associated with surface learning by students [C, 2014; T-P-W, 1999]. A fear of being in front of a class and not being able to answer all questions asked, and a perceived lack of competency has been shown to have a very negative affect on tutor well-being [C, 2022].

Concerned about tutor mental health on M303, and the practicality of our extensive timetable, we initiated conversation with IT about possible alternative Adobe Connect set-ups. After many meetings between the M303 module team, IT and LTS (now LDS), it was agreed that *visible rooms* could be used on M303. By *visible rooms*, we mean an alternative set up in which each tutor has their own individual, personal teaching room that every student can access. This moves teaching from a room shared by tutors to an individual room and is analogous to the common physical teaching experience of secondary schools, where students move from classroom to classroom during the day, whilst the teacher remains fixed in their own room, allowing teachers to customise the classroom to meet their individual requirements.

A report on visible rooms [R, 2018] states that using personal teaching rooms improves tutor satisfaction, decreases workload, improves student interactivity and tutorial quality. In this report we employ Roger's Diffusion of Innovation [R, 2010] and Davis' Technology Acceptance Model [D, 1989] to try to explain how the use of personal teaching rooms may have impacted the adoption and endorsement by tutors of the new group tuition policy (GTP), and subsequently, the way in which any negative impact of the GTP on tutor well-being was avoided.

This work is increasingly relevant today as it shows how personal teaching rooms can enhance tutor well-being and foster greater buy-in to the continuing changes in the University's approach to tuition and tutorials.

Our research questions are:

1. Was buy-in to, and support of, the GTP on M303 increased by personal teaching rooms?
2. Did this improve tutor well-being?
3. Was the timetable facilitated by personal teaching rooms appreciated by students?

Background and motivation

In September 2014 Senate approved the Group Tuition Policy and it was implemented in October 2016. The policy aimed to enhance the University's use of group tuition, 'providing greater quality and parity in the student learning experience' [GTP]. The policy introduced 10 principles, including the formation of tutor group clusters, and enabled a tutorial to be delivered to cluster of several tutor groups. This was a major change from the previous practice where tutors worked primarily individually with their own tutor group.

The marketization of Higher Education introduced a student-as-consumer perspective to learning, increasing the importance of 'good value for money' for most students [T, 2017]. Feedback from our M303 students showed a desire for the flexibility and choice afforded by both live and recorded online sessions.

Therefore, with the aim of simultaneously allowing tutors to specialize and expanding student options, the M303 module team resolved to utilize the GTP to achieve both increased flexibility for students and to enable tutors to focus on their specialist topics.

We designed a comprehensive list of tutor-led module-level tutorials, replacing the standard 7 tutorials per tutor group with an extensive list of about 60 tutor-led sessions in a cost neutral way. These included refresher sessions, essentials sessions for time-constrained students, extension sessions for stronger students, and other ad hoc sessions, along with the more usual tutorials.

However, at university level the implementation of the GTP was not going smoothly [GTP-AE, 2017] and the policy became unpopular with tutors. Many were concerned about the perceived or real effect on the tutor student relationship [D-E, 2018; W, 2018], timetabling was complicated, and the shared room set-up enabled tutors to accidently delete one-another's material or layouts [R, 2018]. By implementing personal teaching rooms for our tutors, we simplified the timetabling and gave tutors 'ownership' of the Adobe Connect rooms in which they gave their tutorials. We hoped that this change would increase tutor satisfaction and willingness to give more deeper tutorials, resulting in increased student satisfaction, and reducing any negative impact of the change to the GTP on tutor-wellbeing.

Literature review/Theoretical framework

Rogers' theory of the diffusion of innovation [R, 2010] and Davis's Technology acceptance model [D, 1989] are two influential frameworks used to understand and explain the way in which innovations and new technology are adopted. Typically, diffusion of innovation theory is used to explain how innovations spread through populations and the technology acceptance model focuses more on the ways in which individuals embrace technology.

There is a third model, the concerns-based adoption model [H, 1979] which was developed using work on teacher change [F, 1969]. However, this model is intended to be used to facilitate change, rather than to explain why change happened [S, 2009] and so is less helpful for our purposes and we focus instead on the work of Rogers and Davis.

Both Rogers' model and the TAM have been used in educational contexts [G-M, 2019; D, 1999] and the two have been combined in educational contexts [L-H-H, 2011].

In his theory of the diffusion of innovation [R, 2010], Rogers explores how new ideas spread and are adopted by a society. He defines five key attributes of a new concept that can influence the adoption process: relative advantage (the perceived benefits of the new idea over previous ones), compatibility (its fit with existing values), complexity (the ease with which the new idea can be understood), observability (the visibility of any results), and trialability (the ability to experiment with the idea before full adoption). Davis's Technology acceptance model [D, 1989] focuses on two factors: perceived usefulness (whether users believe that a new technology will enhance their effectiveness) and perceived ease of use (how easy users think that the new technology will be to understand and use). Relative advantage and perceived usefulness are very similar concepts [A-N-T, 1992; M-B, 1991] and for our purposes can be considered analogous.

Rogers defines an innovation as "an idea, practice or object that is perceived as new by an individual or other unit of adoption" so both the Group Tuition policy itself (which completely redefined the idea of group tuition at the Open University) and Adobe Connect (the new software used) qualify as innovations under this definition. A key point is that the term "technology" in the context of Rogers's

theory is not limited to electronic devices or high-tech solutions but can also encompass ideas and concepts.

A note on language

Since our statement is that it is the *combination* of the GTP and personal teaching rooms (as opposed to the GTP with shared rooms) that facilitated the adoption by M303 tutors of the GTP, along with the positive impact on well-being, it is essential to treat the adoption of the GTP inseparably from the use of personal teaching rooms.

Therefore, we use "GTP in own rooms" (GTP-own) to refer to the implementation of the GTP with personal teaching rooms, and the term "GTP in shared rooms" (GTP-shared) to represent the implementation of the GTP with shared rooms.

Link with well-being

The general impact of technological change on well-being is acknowledged to potentially have adverse effects [O-B-C, 2009]. According to Pfaffenberger [P, 1988], the act of introducing any technology or new idea generates a conception of the societal context in which it will be applied and often brings a prescribed blueprint for how individuals must organize themselves to engage with it: "a set of social and symbolic circumstances in which people…are more or less obliged to carry on their daily affairs." Consequently, the introduction of the GTP alone was likely to increase anxiety among tutors as it was a completely different way of organising a large, and usually enjoyable, part of their day-to-day role (the tuition).

We were concerned that using a shared room set-up would compound the situation, especially since there were several long discussions in the AL forums about the challenges linked to shared rooms; and reading about the challenges faced by a similarly competent colleague can undermine an individual's self-efficacy [B-I, 1978].

Many tutors were worried that the GTP would end the close tutor-student relationship that tutors had with their groups [R, 2018]. In addition, the associated shift from individual to collaborative tutor group tuition would likely raise concerns about territory. Educators can feel territorial about areas of curriculum as well as about their students [B, 1988; H-V-D, 2010] and any change in the control that tutors felt that they had over their groups tutorials could impact the sense of 'ownership' and connection with 'their students', thus giving rise to anxiety [F, 2012; H-V-D, 2010]. Teachers highly value having the own classrooms [B, 1988] and we hoped that giving tutors their own Adobe room might enhance their feelings of ownership and value, consequently reducing the anxiety associated with the shift from individual to shared delivery of tuition.

Justification for the increased use of recordings

Interaction is essential for learning [V, 2012] and producing a large supply of recordings risked deterring students from attending 'live' and interacting with both the tutor and one another. However, evidence suggests that many mathematics students preferred a didactic, lecture-type approach [C, 2019; L, 2016]. Students can interact with content [M, 1989] such as a recording, as well as with one another and the tutor, and lack of one form of interaction could be compensated by an increase in another [A, 2003]. Student interaction within mathematics tutorials tends to be limited due to the difficulty of writing mathematics quickly online and as a result many mathematics tutorials resemble lectures. Students like being able to watch recordings and replay them/pause them at particularly challenging points [B-S-C, 2005].

We decided to combine the tutorial recordings with a tutorial forum, in which the students can interact with tutors and other students asynchronously. This approach offered the additional benefit of transforming the module's structure from one characterized by discrete opportunities for student-student and student-tutor tutorial-related interaction (i.e., the original non-recorded tutor group tutorials) to a model where students could engage continually with the tutor and their peers regarding recorded tutorial content.

Activities

Before the implementation of the GTP, tutors typically conducted tutor group tutorials covering all key module topics. Each session had to accommodate students with all mathematical backgrounds and abilities. Most tutors have specialist expertise on certain topics within the module and so their tutor group could have a richer experience during some tutorials and a less rich one on others.

The introduction of the GTP on M303 from September 2016 forced us to reconsider this approach to tuition. We realised that by pooling all the time allocated for tuition and asking tutors to give all their tutorials across the cohort (i.e. at module level – typically around 150 students), we could offer a wider variety of tutorials. We could also enable tutors to concentrate on their specialisms.

To meet the differing needs of the students we split our tutorials into different types:

1. **Refresher tutorials**: these important tutorials would set up students for the study that they were about to do on M303. It was essential that these tutorials were timetabled shortly before students started studying the related module material,
2. **Essential tutorials**: these would cover the material in the module that was core and (perhaps) required later in the module. These tutorials would be directly connected to identified core material listed in the module study calendar.
3. **Extension tutorials**: these would look at some of the more difficult/subtle parts of the module in greater detail and were aimed at those students seeking to gain a grade 1 or 2 pass.
4. **Standard tutorials**: these were similar to the original (pre-GTP) tutor group sessions but now given at module level.
5. **Ad hoc special interest tutorials**: These were not formally timetabled in advance and were not assessed. They were on topics related to material in the module but possibly going beyond it.

We gave all students explicit information about the diverse types of tutorial, and the differing levels of difficulty of content and the speed at which it would be covered, so that they could self-select the ones most appropriate for them at any given point of their study of the module.

The tutors on M303 were very experienced and we wanted to ensure that we took their insights into account when planning tutorials, so we involved them closely in the timetabling process. After creating an initial sketch of tutorial topics (see Appendix 1), we invited comments and suggestions from the tutors. We also organised a face-to-face staff development day where they could discuss the proposed M303 timetable. Taking into account the feedback that they gave us, a timetable was agreed and the GTP was implemented for the 2016J presentation of M303 (see Appendix 2).

The module team also started to investigate, in collaboration with LDS and IT, the possibility of making tutor rooms open (or visible) to all students. This turned out to be possible and individual, teaching rooms (known as 'visible' rooms) were added to M303.

To track whether this novel approach was successful, we monitored both the attendance of the students (to both live sessions and recordings of them) and the reactions or comments of the tutors.

We were particularly interested in finding out whether tutors had more buy-in to the approach taken on M303 compared to other modules and whether their experience of the GTP was better or worse than they expected on M303. Therefore, we created a questionnaire based on a version of the Technology Acceptance Model Questionnaire [D, 1989] and sent it to the tutors to evaluate their feelings about their experience of GTP on M303, and to evaluate their feelings about GTP on a module using shared rooms (if they were worked on one).

We decided to use mixed methods [J-O-T, 2007] to expand our viewpoint [G-C-G, 1989] and used Microsoft forms to develop the questionnaire containing both survey questions and free text boxes. This was distributed it to all tutors; see Appendix 3 for a list of the questions. To analyse the free text comments, we used an approach based on thematic analysis [B-C, 2006] but adapted to better suit the size of our data set [F, 2021; B-C-H, 2022]. The authors independently thoroughly familiarised themselves with the data and then met up to discuss the themes that they had identified.

Following our experiences implementing this new approach to tutorial delivery, we wrote a short report describing the practical steps that we took to implement GTP-own [R-O, 2020].
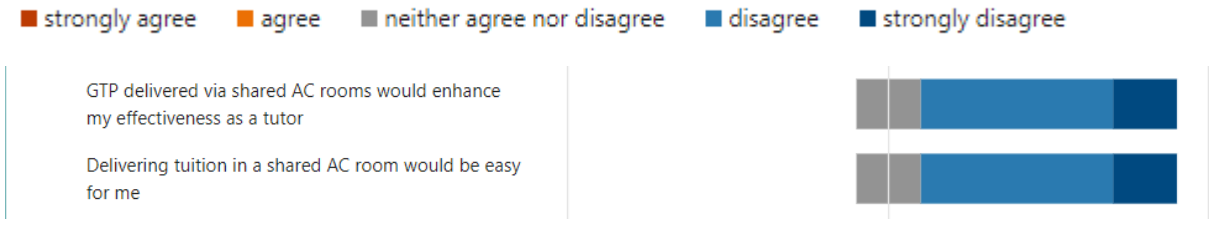
Findings

The survey results show that tutors were indeed anxious about GTP-shared.

The results also indicated that many tutors did not think that it would make things better for students or tutors,

with the relative advantage of GTP-shared being perceived as particularly absent.


When thinking about their experience after having used GTP-shared, tutors reported a more negative impact on their well-being when sharing rooms compared to the experience of using personal teaching rooms. More tutors found the experience stressful when sharing rooms, the findings indicated that

timetabling was less effective and less efficient when sharing rooms and practising appeared easier in personal teaching rooms.

Shared rooms
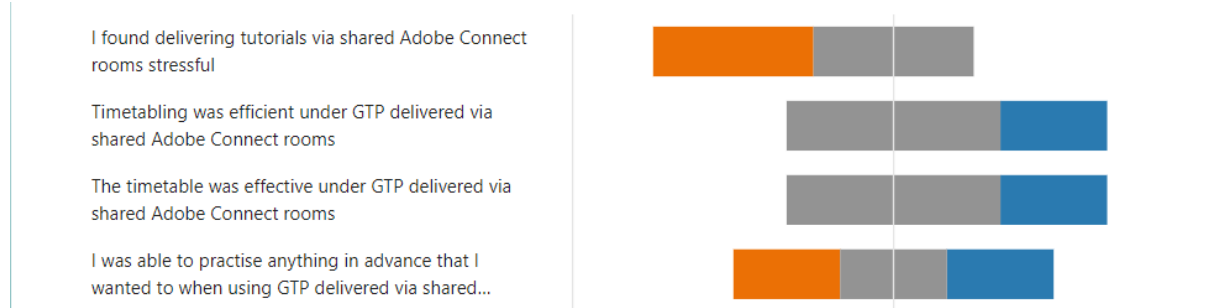
Visible rooms

The response to the question asking whether the tutors felt that overall the GTP delivered using each set-up made things better for the students was particularly striking.

Shared rooms
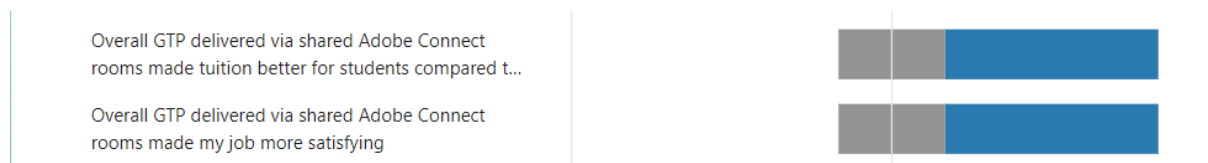
Visible rooms

Student response to timetable

We experimented with two timetables during 17J and 18J. Both contained 27 core sessions. This was made up of four tutorials on Book A (A1 to A4) and three each on books B to F (B1 to F3) plus one revision session per book (Ra to Rf) and two revision day schools, labelled as below.

	Topic	Book A				Book B			Book C			Book D			Book E			Book F			Revision							
Code	A1	A2	A3	A4	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2	E3	F1	F2	F3	RA	RB	RC	RD	RE	RF	DS1	DS2

Some students can take multiple attempts to enter a room which artificially inflates the viewing figures. Therefore, all viewings' data was cleaned by removing any viewings made within 2 minutes of a previous viewing. We compared M303 figures with those from modules using shared rooms.

In 18J, 77% of students on M303 opened at least one recording, and there was an average of 17.2 viewings per student. This compares to 54% of students viewing at least one recording on MT365 in 18J, with an average of up to 9 viewings per student [C-T-R-H-R-P, 2020]. On M248 in 18J, 37% of students viewed at least one recording.

These figures indicate that the M303 tutorial timetable was effective in increasing student engagement with recordings.

Over 17J and 18J, a total of 217 students finished M303. The timetable offered core tutorials and other sessions.

The percentage of these students who engaged with each of the 27 core tutorials is shown below.

Percentage of 217 finishing students engaging with core tutorials
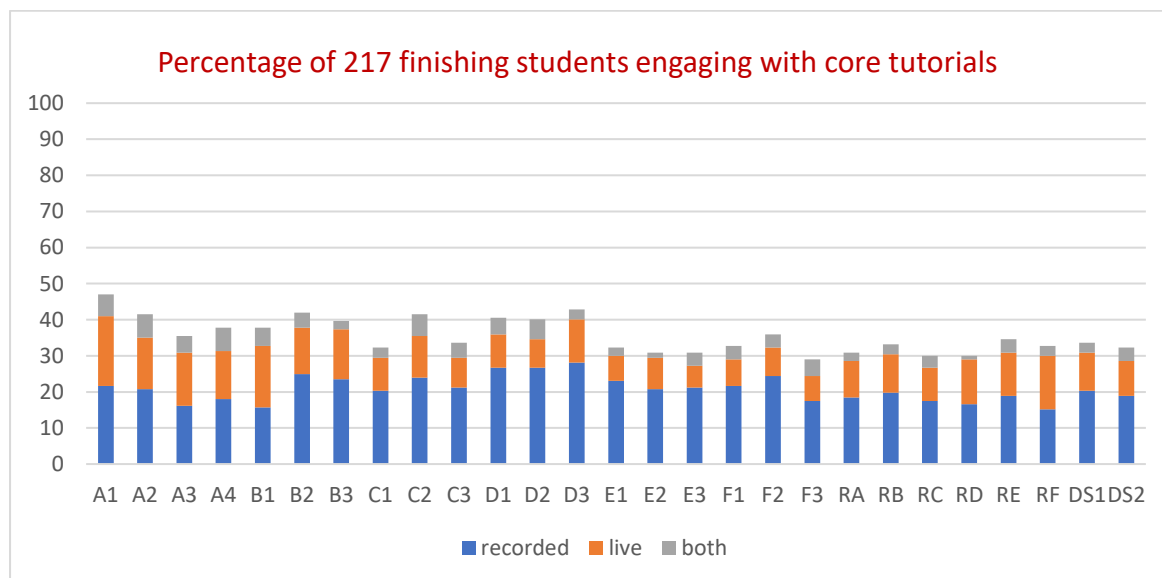
Over the two presentations engagement with the core tutorials ranged between 29% and 47%, averaging 36%.

In general students made more use of recordings than live attendance, often looking at recordings more than once.

Percentage of finishing students engaging with core tutorials
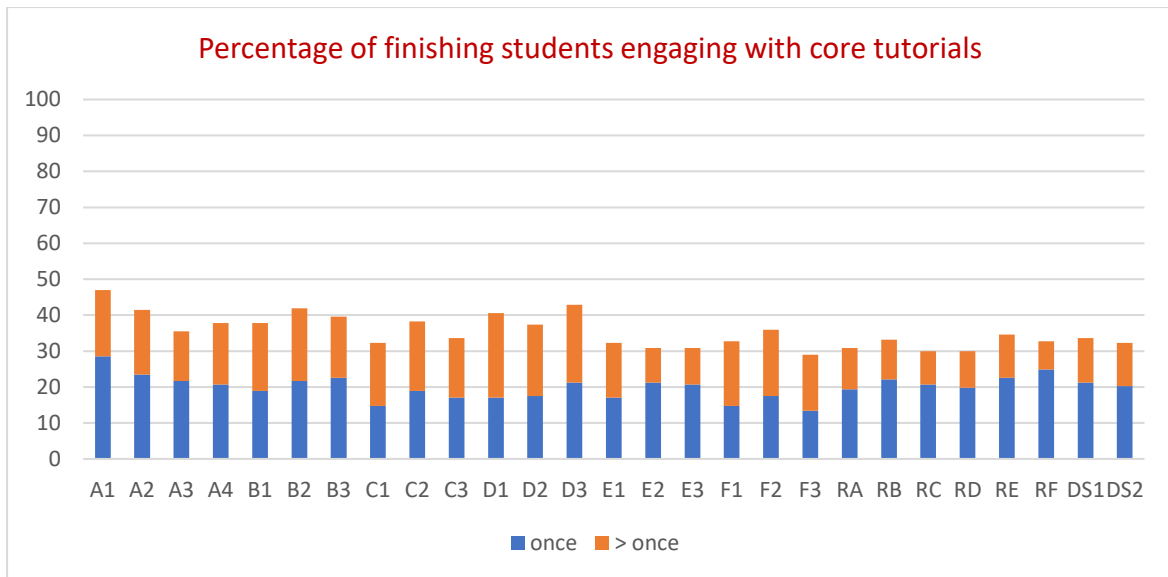
We experimented with different non-core sessions, but each year ran two refresher sessions on each of books B, D, E and F; two TMA specific sessions (for books D and F) and one session on a particular formative question (Q8).

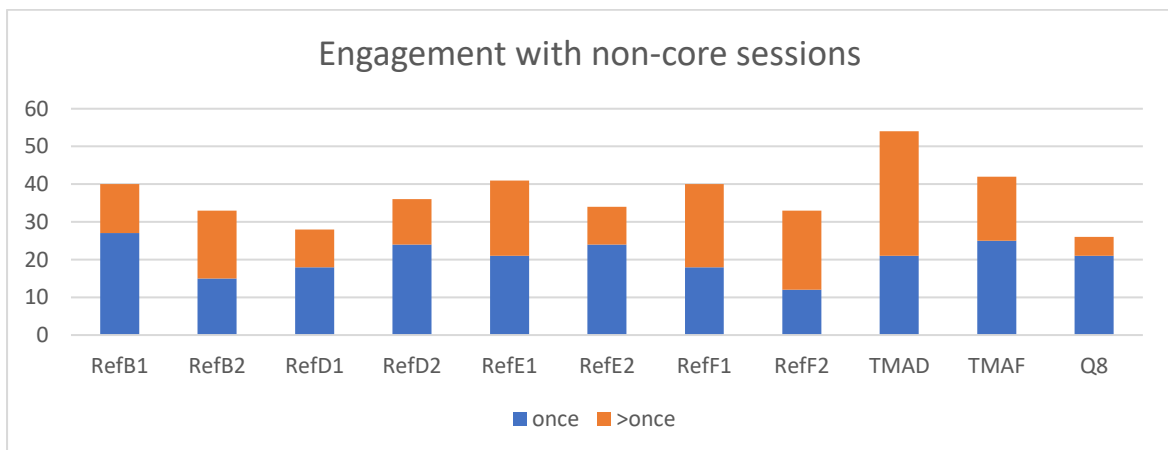| Topic	Book B		Book D		Book E		Book F		TMAs		
Code	RefB1	RefB2	RefD1	RefD2	RefE1	RefE2	RefF1	RefF2	TMAD	TMAF	Q8

Student engagement with these sessions was very good, particularly (as may be expected) with the TMA-focused sessions.

Engagement with non-core sessions

To access whether engaging with tutorials was having an effect on our students we compared their final mark gained on M303 with the final mark that they gained on the precursor module, M208.

M303 mark as a percentage of M208 mark	M208 average mark of group	Mean number tutorials attended	Mean engagement points with core tutorials	Mean engagement points with non-core tutorials	Mean live tutorials attended
≥ 90%	76.3	10.7	20.1	7	4.0
< 90%	77.5	7.7	13.5	5.9	3.9

This appears to suggest a relationship between tutorial engagement and final mark.

Discussion

Affordances

GTP-own and GTP-shared have different affordances. In a shared room setup tutors still have individual tutor group rooms and so have a private space for practice in both configurations. However, in GTP-shared, any resources set up and created in the practice room must then be replicated in the shared teaching room. In contrast, GTP-own enables tutors to practise directly in their teaching room and avoids the need for them to replicate their materials elsewhere, allowing them to teach in the same environment as the one in which they practised. This eliminates any additional risk and workload associated with transferring materials from one room to another.

Although GTP-shared allows for some specialization and provides students with more choices, the logistical difficulty of setting up complicated timetables in the shared room significantly reduces the potential advantages. Using GTP-own instead maximises both flexibility with timetabling and specialism of tutors.

Before using them, it was difficult for tutors to visualise how shared rooms would work because it was a completely new way of working for most. However, the use of an online individual room resembled the familiar and much-loved face-to-face set ups used in most secondary schools where teachers had their own classrooms and students moved from room to room [H-V-D, 2010].

Affordances diagram
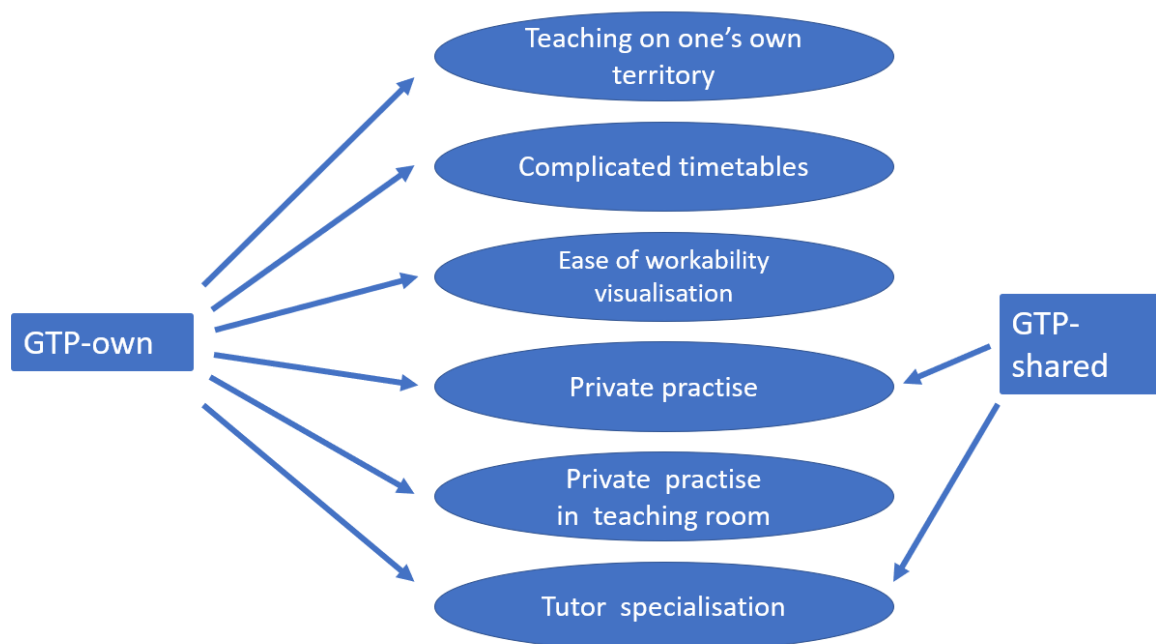
As can be seen from the above diagram, GTP-own offers more affordances than GTP-shared.

Interpretation within the context of Roger's and Davis's models.

These models cover various concepts, and we discuss each with respect to GTP-own and GTP-shared.

Relative advantage and Perceived usefulness

In theory, the increased flexibility created by the GPT allows module teams to offer a timetable with a broader range of tutorial types, along with increased flexibility in terms tutorial times. However, in practice, the constraints and complexity associated with timetabling within a shared room hindered

the full realization of this flexibility. The adoption of personal teaching rooms effectively eliminated these constraints, enabling the M303 module team to fully leverage this enhanced flexibility and to produce a well-structured timetable featuring diverse tutorial options such as refresher sessions, essential sessions and extension sessions that enabled the students to self-select a study pace and style.

This new timetable is also advantageous for tutors as they can specialize in their areas of expertise. However, these advantages are counterbalanced by the perceived drawbacks of a potential negative impacts on the tutor-student relationship and the loss of control over the students' educational experience by the tutors.

Comment from tutors on their feeling in the run up to the implementation of GTP-shared include:
"The AC trainers had to keep reminding themselves that we were likely to be using shared rooms, and clearly didn't think it was a good idea."

"I feared that students would end up with a less rich provision of teaching and learning activities."

Comments concerning GTP-own include:
"[I am] working in cooperation with my fellow ALs (and the Module Team) to offer a rich package of sessions for each cohort."

"Attendances are far better than before"

Therefore, we felt that the ability to produce a far more varied timetable using GTP-own over GTP-shared gave GTP-own a much greater relative advantage over the previous set-up than GTP-shared.

Compatibility

The desire for a personal space is acknowledged [P-K-D, 2001] and a sense of territoriality can apply to ideas and groups as well as physical spaces [H-V-D, 2010], with control being a key factor in the development of a sense of psychological ownership [P-K-D, 2001]. Under the previous tuition model, the tutor had complete control over all the tutorials attended by students in the tutor group.

Bruckerhoff [B, 1988], after a 7-month field study of an American high school, described the classroom as a "highly valued territory", and we hoped that by giving our tutors an online version of this personal space, we would reduce some of the negative feelings associated with the move to the GTP.

In addition, the tutorial forum enabled tutors to still have a relationship with students and time freed up from specialising created free time for tutor group sessions. Letting students self-select teaching speed and approaches fits with the student-centred values of our tutors.

Comments from tutors on GTP-shared include:
"I thought that the needs of a system, rather than the needs of pedagogy, were driving the system."

Comments from tutors on GTP-own include:
"I very much value having my own room."

"the students seem happy, and they don't seem to have any trouble finding the right room."

"Under the M303 online tutorial setup, I feel part of a team"

We felt that using personal teaching rooms was compatible with the desire for a sense of personal territory and space.

Complexity

Trying to visualise the implementation of the GTP using shared rooms inevitably lead to concern over the logistical problems of sharing a room, whereas GTP-own was easy to map onto the standard secondary school set up where teachers teach in their own classroom and the students move around. Using individual rooms removed the need to worry about accidentally deleting someone else's material or finding that your own material had been deleted. This simplified the entire process.

Comments from tutors on GTP-shared include:

"I like to set up dynamic interactive tutorial activities, using draw tools on an uploaded PowerPoint, and polls, in advance of the tutorial. I was concerned that this would be difficult, with several tutors trying to access the room, and that other tutors might inadvertently delete or change my materials."

Comments from tutors on GTP-own include:

"I need not worry about messing up someone else's stuff."

We felt that GTP-shared had more complexity than GTP-own.

Observability

Observability refers to the degree to which the results of an innovation are visible to the potential adopters. The plethora of forums at the OU, coupled with the number of posts describing problems stemming from the use of shared rooms [R, 2018], resulted in the impact of this high observability of GTP-shared being negative.

Once the M303 tutorials' programme started, each tutor could see both that students were using the recordings and the positive posts from students in the tutorials forum further reinforcing the idea that the GTP-own system on M303 was working well.

Trialability

The fact that the M303 tutors could set everything up and practise in their teaching room meant that there was considerable trialability. With the shared rooms, tutors had to create everything twice, once in the practice room and again in the shared room. This meant that the actual resources being used could not be easily trialled. As one tutor commented [R, 2018]

"[Using a visible room I could] plan how the tutorial would go, without getting mixed up with other tutors' stuff. I was able to prepare better material, and I felt confident and not stressed. Sharing was the opposite."

We felt that the fact that resources in GTP-shared could not be tested in the room where they would be used limited the trialability of GTP-shared.

Perceived ease of use

It was very clear from the tutor comments that GTP-shared was not viewed as being easy to work with, but that GTP-own was viewed more positively.

Comments from tutors on GTP-shared include:

"GTP in implementation struck me as regimented and inflexible and not therefore adaptable, at short notice, to the needs of a particular cohort."

"I think preparing and managing tutorials would be quite stressful [in a shared room]"

Comments from tutors on GTP-own include:

"I like being confident that all my teaching materials will be as I left them"

"I like being able to access the room whenever it suits me, to set up"

Overall analysis of free text comments.

We asked three questions with free text box responses. Two were related to GTP-shared and one related to GTP-own.

Two themes developed strongly from analysis of the comments made about GTP-shared before implementation. These were "system-focused" and "less rich".

Tutors talked about the rules, training, and procedures seeming to be primarily driven by the needs of the software system and not by pedagogy, consideration of the student experience or of tutor well-being. They also felt that a less rich tutorial experience was an inevitable outcome.

Only one further theme developed from the comments about GTP-shared after implementation. This was one of workarounds/avoidance.

In contrast, the themes that developed from analysis of the comments relating to GTP-own were: richness of tutorials; valuing of tutors; control and flexibility.

Feedback from students

SEAM comments indicated that the students liked the variety of tutorials that were enabled by GTP-own.

"I loved the fact that we had essentials tutorials and extension tutorials."

"Tutors and tutorials have been amazing."

"The support from the tutors and all the teaching staff was by far the best I have experienced in my 7 years with the OU."

"the way they [the tutors] work to together and share tutorials is very effective and efficient."

Comments also indicated that the tutors were particularly enthusiastic (possibly as a result of being able to specialise):

"There was a feeling from several of the tutors that we were being taught, not just to fill some quota of teaching hours, but because these tutors found the subject genuinely interesting and were eager to pass on their enthusiasm."

"There was sometimes an air that the tutors couldn't wait for us to get to the next juicy bit."

"[the tutors] were a team and worked together to give a host of tutorials at various days and times that covered the course extremely well."

Conclusions

Our research questions were:

1. Was buy-in to, and support of, GTP on M303 increased by personal teaching rooms?
2. Did this improve tutor well-being?
3. Was the timetable facilitated by personal teaching rooms appreciated by students?

We believe that there is evidence to suggest that the use of personal teaching rooms did increase buy-in to and support of the GTP amongst M303 tutors. We also believe that using personal teaching rooms had a significant positive effect on tutor well-being. Finally we feel that the timetable made possible by using personal teaching rooms was appreciated by students and had a likely positive effect on their results.

Areas for further study.

We have not yet analysed the interaction in these sessions, but we have looked at chat listings from several tutorials held during March 2022 and compared the M303 chat to that of our precursor L2 module, and also our comparator L3 module. (We analysed the chat because students in mathematics tutorials tend to favour using a chat box over speaking.) From this quick initial look it appears that the interaction in M303 is typically higher than that in tutorials help in shared rooms and we hope to investigate this further in the future.

Impact

As a result of this work and other trials, visible rooms are now being rolled out across many more maths modules.

Deliverables

Preliminary results were included in a QELS presentation given in February 2019 [R-O, 2019].

Report: Adobe Connect Visible rooms – implementation report and good practice recommendations [R-O, 2020].

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Appendix 1: Timetable map (initial draft as shared with tutors).

Central node: **GTP M303**

LE 1: Introduction to module
- Online/meet your tutor 1 hour
- Stuff they need to know from M208 (to be provided by MT)
- Week 1 of module (to be recorded)

LE 2: Book A
- Online 1 hour
- 1/2 tutors do this
- Chapters 1 and 2 concentrating on induction
- Week 2 (recorded)

LE 3: Book A
- Online 1 hour
- 1/2 tutors do it
- Chapters 3 and 4, concentrating on congruence
- Week 4 (recorded)

LE 4: Book B
- online and f2f 2 hours
- (n-2) sessions where n is the number of tutors
- Core material of group theory that is important for assessment
- Weeks 7/ 8
- at least two tutors to give online sessions, remainder f2f determined by student distribution

LE 5: Book B
- Online 2 hours over two sessions
- non-core material of group theory
- Weeks 7/8
- focus on more subtle aspects of Book B

LE 6: Book C
- online 1 hour
- to cover core parts of Chapters 9 and 10.
- Weeks 10/11
- only 1/2 tutors to do

LE 7: Book C
- online 1 hour
- introduction to rings (Chapter 11)
- only 1/2 tutors to do
- week 12

LE 8: Book C
- online 1 hour
- domains – Chapter 12
- only 1/2 tutors to do
- week 13

LE 9: Book C
- online 1 hour
- non-core on rings
- only 1/2 tutors to do

LE 10: Book D
- online 1 hour
- only 1/4 tutors to do
- continuity in \R and \R^2
- lecture style
- week 14

LE 11: Book D
- f2f 2 hours
- core of Chapters 14, 15 and 16
- week 16/17/18
- 3/4 of tutors to do

LE 12: Book D
- online 1 hour
- only 1/4 tutors to do
- subtle aspects of Book D
- week 17/18

LE 13: Book E
- online 1 hour
- only 1/2 tutors do each one
- on Chapter 17
- week 19

LE 14: Book E
- online 1 hour
- only 1/2 tutors
- on core Chapter 18
- week 20

LE 15: Book E
- online 1 hour
- only 1/2 tutors do each one
- on core of Chapter 19: Field extensions
- week 21

LE 16: Book E
- online 1 hour
- subtle aspects of Book E (eg: splitting fields)
- only 1/2 tutors
- week 22

LE 17: Book F
- online 1 hour
- revision of Book D
- 2 tutors to do this
- week 23

LE 18: Book F
- f2f 2 hours
- (n-4) tutors
- on core of Chapters 21 to 24
- weeks 25/26/27

LE 19: Book F
- online 1 hour
- 2 tutors
- subtle aspects of Book F
- week 26/27

LE 20: Revision Book A (Theory focused)

LE 21: Revision Book A (Examples focused)
- online 1 hour
- two tutors (same as LE 20)
- week 27

LE 22: Revision Book B (Theory focused)

LE 23: Revision Book B (Examples focused)

LE 24: Revision Book C (Theory focused)

LE 25: Revision Book C (Examples focused)

LE 26: Revision Book D (Theory focused)
- online 1 hour
- 2 tutors only
- week 28

LE 27: Revision Book D (Examples focused)
- online 1 hour
- two tutors (same as LE 26)
- week 28

LE 28: Revision Book E (Theory focused)
- online 1 hour
- 2 tutors

LE 29: Revision Book E (Examples focused)
- online 1 hour

Appendix 2: Draft tutorial timetable

Here we give an early draft of the proposed topics for the M303 tutorials.

Title
Book A
Online tutorial on book A part 1: Induction
Online tutorial on book A part 1: Induction
Online tutorial on book A part 2: Euclid's Algorithm and Diophantine equations
Online tutorial on book A part 2: Euclid's Algorithm and Diophantine equations
Online tutorial on book A part 3: Congruence
The essential Book A part 1
Online tutorial on book A part 3: Congruence
Groups - Refresher 1
Online tutorial on book A part 4: Fermat and Wilson's Theorems
The essential Book A part 2
Online tutorial on book A part 4: Fermat and Wilson's Theorems
Groups - Refresher 2
Book B
TMA01 cut off
Special interest colloquium: history-group theory (tbc)
Online tutorial on book B part 1: Introduction
Online tutorial on book B part 1: Introduction
Book B extension 1
Early online day school on book B
The essential Book B part 1
Online tutorial on book B part 2: Classification of Abelian groups
Online tutorial on book B part 2: Classification of Abelian groups
Mid online day school on book B
Online tutorial on book B part 3: The Sylow Theorems
Online tutorial on book B part 3: The Sylow Theorems
Book B extension 2
The essential Book B part 2

Book C
Online tutorial on book C, Chapters 9 and 10
Focus on Correspondence theorem
TMA02 cut off
Special interest employability session: Actuarial Life Tables
The essential Book C part 1
Online tutorial on book C, Chapters 11 and 12 part 1: Introducing Rings
Online day school on book C, Chapters 11 and 12: Rings part 1
Book D - refresher 1
Online tutorial on book C, Chapters 11 and 12 part 2: Introducing Domains
The essential Book C part 2
Online day school on book C: part 2
Book D - refresher 2
Book C extension 1
Book C extension 2
Book D
TMA03 cut off
Online tutorial on book D part 1: What is a metric
Book D extension 1
Online tutorial on book D part 2: Examples of Metrics
Day school on book D part 1
Day school on book D part 2
Special interest colloquium: history, analysis (tbc)
Online tutorial on book D part 3: Open and closed sets
Book E - refresher 1
Special interest colloquium: Cantor
The essential Book D part 1
Book E - refresher 2
The essential Book D part 2

Book E
Online tutorial on Chapters 17, 18 and 19 part 1: Rings revisited and extended
Book D extension 2
Online tutorial on Chapters 17, 18 and 19 part 2: Fields, a first pass
<mark>TMA04 cut off</mark>
Online day school on book E chapters 17,18 and first half on 19 - part 1
Online tutorial on Chapters 17, 18 and 19 part 3: Fields continued
Online day school on book E chapters 17,18 and first half on 19 - part 2
The essential book E part 1
Book E extension 1
The essential book E part 2
Book F - refresher 1
Book E extension 2
Focus on Eliptic curves
<mark>TMA05 cut off</mark>
Book F - refresher 2

Book F
Online tutorial on book F part 1: Connectedness
First online day school on book F
The essential book F part 1
Special interest colloquium: history, a mathematicain or two (tbc)
Book F extension 1
Online tutorial on book F part 2: Compactness
Second online day school on book F
The essential book F part 2
Online tutorial on book F part 3: Completeness
Book F extension 2

Revision
Revision online tutorial on book A
Essential revision part 1
Revision online tutorial on book B
Revision weekend day 1 part 1
Revision weekend day 1 part 2
Revision weekend day 2
Revision online tutorial on book C
Revision online tutorial on book D
Essential revision part 2
Revision online tutorial on book E
Revision day school
Revision online tutorial on book F

Appendix 3: AL Questionnaire

The questionnaire was published via Microsoft Forms and is a modification of the Technology Acceptance Questionnaire proposed in [D, 1989]. In the following, we give the explanatory text and questions that we asked.

In this questionnaire, we (Hayley and TC) are going to ask about your experiences with the Group Tuition Policy (GTP) and Adobe Connect (AC) rooms on modules that you have taught on. We are particularly interested in how you have found the implementation on M303 but will also ask you about your other experiences of teaching online at the Open University since the GTP was implemented.

We asked the first two questions to ensure that participants were only directed to questions relevant to their experiences as an AL.

1	Have you taught for the Open University on any modules other than M303 since 2016J?	Yes	No
2	Did you start working as an Associate Lecturer for the Open University before 2016?	Yes	No

ALs were asked the next question if they answered 'Yes' to Questions 1 and 2.

3	For this part we'd like you to recall your feelings about the new Group Tuition Policy (GTP) when used with shared Adobe Connect (AC) rooms. We would like you to rate and describe your feelings **before you started** tutoring under the changed approach. Please select one radio button for each question.	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
	I was anxious about the introduction of the GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
	I could see how timetabling and tuition would work for the GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
	Timetabling was efficient under GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
	The timetable was effective under GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
	I felt confident about being able to practise anything in advance that I	○	○	○	○	○

	wanted to when using GTP delivered via shared Adobe Connect rooms					
	Overall GTP delivered via shared Adobe Connect rooms seemed likely to make tuition better for students compared to the pre-GTP setup.	○	○	○	○	○
	Overall GTP delivered via shared Adobe Connect rooms would make the job more satisfying	○	○	○	○	○
	GTP delivered via shared Adobe Connect rooms would have a negative impact on the tutor-student relationship	○	○	○	○	○
	I would be able to teach more of my own specialist interests when tutoring using GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
	The number of hours that I would spend tutoring groups would be reduced under GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
	GTP delivered via shared AC rooms would enhance my effectiveness as a tutor	○	○	○	○	○
	Delivering tuition in a shared AC room would be easy for me	○	○	○	○	○
	I was worried about loss of control over my group(s)' tuition in a shared AC room	○	○	○	○	○

ALs were asked Question 4 if they had answered 'Yes' to Questions 1 and 2.

4	Please tell us any thoughts or feelings that you had in the lead up to the implementation of the GTP in shared AC rooms. The more information you can give us the better.
	Free text box.

ALs were asked Question 5 if they had answered 'Yes' to Question 1.

5	For this part we'd like you to recall your feelings about your experience with the Group Tuition Policy (GTP) when used with shared Adobe Connect (AC) rooms for a module **other** than M303. We would like you to rate and describe your feelings **after** you had tutored online using the changed	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree

approach. Please select one radio button for each question.					
I found delivering tutorials via shared Adobe Connect rooms stressful	○	○	○	○	○
Timetabling was efficient under GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
The timetable was effective under GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
I was able to practise anything in advance that I wanted to when using GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
Overall GTP delivered via shared Adobe Connect rooms made tuition better for students compared to the pre-GTP setup.	○	○	○	○	○
Overall GTP delivered via shared Adobe Connect rooms made my job more satisfying	○	○	○	○	○
GTP delivered via shared Adobe Connect rooms had a negative impact on the tutor-student relationship	○	○	○	○	○
I was able to teach more of my own specialist interests when tutoring using GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
The number of hours that I spent tutoring groups reduced under GTP delivered via shared Adobe Connect rooms	○	○	○	○	○
GTP delivered via shared AC rooms enhanced my effectiveness as a tutor	○	○	○	○	○
Delivering tuition in a shared AC room was easy for me	○	○	○	○	○
I lost control over my group(s)' tuition in a shared AC room	○	○	○	○	○

ALs were asked Question 6 if they had answered 'Yes' to Question 1.

6	Please tell us any thoughts and feelings that you had after the new GTP and shared AC rooms approach had been implemented. The more information you can give us the better.
	Free text box.

All ALs were asked to answer Questions 7 and 8.

7	For this part we'd like you to think about your feelings about the Group Tuition Policy (GTP) used with visible Adobe Connect (AC) rooms in the context of M303. The setup in M303 is different to many other modules in that you have your own Adobe Connect room and any student on the module can attend tutorials that you run. Please select one radio button for each question.	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
	I find delivering online tutorials for M303 stressful	○	○	○	○	○
	Timetabling tutorials for M303 is efficient	○	○	○	○	○
	The tutorial timetable for M303 is effective	○	○	○	○	○
	I am able to practise anything in advance when doing online tutorials for M303	○	○	○	○	○
	The M303 online tuition setup makes tuition better for students compared to how things were before the introduction of GTP	○	○	○	○	○
	Delivering M303 online tutorials makes my job more satisfying	○	○	○	○	○
	The M303 online tutorial setup has a negative impact on the tutor-student relationship	○	○	○	○	○
	I am able to teach more of my own specialist interests when tutoring online for M303	○	○	○	○	○
	The number of hours that I spent tutoring groups reduced under the M303 online tutorial setup	○	○	○	○	○

	The M303 online tutorial setup enhances my effectiveness as a tutor	○	○	○	○	○
	Delivering tuition in my online M303 room is easy for me	○	○	○	○	○
	Having my own online tutorial room in which I give all of my M303 tutorials gives me a sense of personal space	○	○	○	○	○
	The M303 online tutorial setup is better than the old way of doing online tutorials for just my group(s)	○	○	○	○	○

8	Please add any thoughts and feelings that you have around the M303 online tutorial setup. The more information you can give us the better.
	Free text box.