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# Technicians' Support: A crucial dimension for implementing creative change in D&T classrooms

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## Abstract

In the context of an ongoing research and intervention project 'Subject Leadership in Creativity in Design and Technology' funded by the Gatsby Foundation certain factors were identified as either supportive or hindering to the realisation of the main aim of the project which is introducing changes in teaching practices that help develop students' creativity. To better understand these factors, participating teachers were interviewed regularly to discuss the progress made in their schools. In these interviews, teachers indicate the importance of the support of the technician in the D&T department and highlight the impact of this support on teachers' adoption of the teaching practices which the project recommends for enhancing the possibility of students engaging in creative designs for the subject projects.

It became clear that technicians needed to redefine their roles to be supportive to teachers during the process of change, yet this would only take place if technicians were involved in the change process from its outset. If these two conditions were met, the result was that technicians supported and facilitated students' creativity. Hence, the paper highlights the importance of engaging the technician from the outset of change to ensure his/her support to the teachers and outlines possible ways for developing this kind of engagement.

## Key words

technicians in D&T, support staff, change, leadership, professional development, creativity

## Context of the Problem

In the context of an ongoing research and intervention project 'Subject Leadership in Creativity in Design and Technology' - funded by the Gatsby Foundation - certain factors were identified as either supportive or hindering to the realisation of the main aim of the project which is introducing changes in teaching practices that help develop students' creativity 'Nicholl and McLellan, (2007), (2008)'. To better understand these

factors participating teachers were interviewed regularly to discuss and reflect on the progress made in their respective schools. During these interviews, some teachers explicitly expressed that there were certain aspects in their work environment that made it more difficult for them to adopt the changes introduced by the project's approach. Among these, teachers list factors such as administrative demands, assessment procedures and lack of support from heads of departments, colleagues, and department technicians.

Accordingly, it was necessary to further investigate these "barriers" (Davis, 1999) which could discourage teachers from introducing changes which enhance the possibility of students engaging in creative designs for the subject projects. It is therefore beyond the scope of this paper to tackle all the above listed factors, but it will try to investigate one of them, namely, the role of the technician in the D&T department and the tension that could result when the teacher tries to adopt the creativity approach and is faced by lack of support or even acts of hindrance from the department technician. Moreover, the paper will highlight the importance of engaging technicians from the onset of change to help them understand the importance of their role in enhancing students' creativity and it will outline possible ways for developing this kind of engagement. This is necessary to ensure the technician's support for the teacher and the students during the proposed process of change.

## Theoretical Context

Researchers investigating change in teachers' classroom practices, agree that changing teaching practices is demanding on teachers both cognitively and emotionally. Accordingly, to ensure the introduction and sustainability of change in teaching practices, teachers need to apply what they have learnt in professional communities which can provide them with the emotional and cognitive support that they need (Halliday, (1998); Levin, (1995); Little, (1990), (1999); McLaughlin in Hargreaves and Evans, (1997); McLaughlin and Talbert, (2001).

A member of these communities and a major source of support for D&T teachers is the department technician. The Design and Technology Association website explicitly states that “Technicians play a crucial role in supporting and directly improving students’ learning experiences in D&T” and it lists “supporting teachers and helping students to get the most out of their learning experience” among the technician’s responsibilities.

This role and its importance were highlighted in the context of the creativity project described above. The main aim of the project was to introduce changes in teaching practices that help develop students’ creativity. During the intervention phase of the project teachers were encouraged, among other recommendations, to create a climate in their classrooms that is more conducive to creative understanding and creative outcomes. According to Ekvall (1983), such a climate is characterised by certain dimensions, some of these are: freedom and choice, idea-time, idea-support and risk-taking. In a climate where students have freedom and choice, they are “...given the autonomy and resources to define much of their work”, and in climates where there is high idea-time “...possibilities exist to test suggestions not included in the task assignment” and “There are opportunities (for students) to take the time to explore and develop new ideas”. Moreover, Ekvall (1983) explains that climates need to be supportive of creativity; in the case of the classroom, this would translate into listening to students and encouraging them to take initiatives and providing them with opportunities to try out new ideas. Moreover, a classroom climate can be considered high in risk-taking when “...bold initiatives can be taken even when the outcomes are unknown” and where “[students] feel as though they can ‘take a gamble’ on their ideas”.

To create such a climate in D&T classrooms teachers need support from the SMT (Senior Management Team), the HoD (Head of Department), their colleagues and, crucially, the support of the department technician. The technician’s support is especially important because it is his/her responsibility to provide teachers with the necessary resources which include materials for students to use as part of their designing and making tasks, and thus are part of the team that influence the change in the climate. This is important in the context of this paper and will be discussed in due course. Moreover, according to the Design and Technology associations website technicians are expected to support teachers during lessons and may at times be asked by the teacher to aid students while executing their designs. This allows for the technician to be present in the classroom, to interact with the students and to play a role in shaping students’ learning experiences. Thus, the focus of this paper is the role of the technician in helping

teachers adapt to change, in this case, helping them to develop a creative climate.

Yukl (2006) suggests there are certain actions that need to be taken by the “leaders of change” to insure the much needed support of all parties involved. Among these actions, the leader of change needs to:

- build a coalition of supporters from the people who have the power or the means to facilitate or block the change;
- understand the identity of people whose support is necessary for the change to take place and how this identity will be affected by the change;
- prepare people to adjust to change by informing them about the issues involved in the proposed change.

In the creativity project described above, the leaders of change were the Creative Co-ordinators (CCs) who had the challenging role of “Lead(ing) their respective departments in adopting the creative aims of the project” ‘Nicholl, McLellan and Kotob, (2008)’. The CCs were expected to introduce the project to their respective department members including the technicians, and to help them understand the importance of creating a classroom climate conducive to creativity.

It was during one set of interviews that several teachers spoke about a tension between affecting change for a creative climate and the role of the technician. Several technicians questioned the creative approach saying ‘we haven’t got the materials’, and ‘that’s too expensive’. The technicians also expressed difficulty in ‘having the time’ to prepare the materials required by the new creative approach. Davis (1999) refers to people such as these as ‘squelchers’ who tend to either say things to themselves, or to other people, that could inhibit creativity. Potentially, these behaviours had serious implications for creating a climate conducive for creativity and we thought were worthy of further investigation as such “barriers” would help our understanding of the factors that stood in the way of helping students to realise their creative potential.

One of the main aims of the project was to encourage teachers to gear their students away from tasks that were procedural (i.e. making a box)— where technicians prepared materials well in advance of the lesson but offered little scope for students to develop creative ideas (Amabile, (1983))— to more ambiguous and risky tasks, where the outcomes and hence material sizes/forms for example, could not be too constraining to design ideas from the outset (Doyle, (1983)). The project suggested an approach whereby students were set challenging tasks and where they had an element of choice with respect to materials. This was borne out of the climate research (discussed previously), the literature on motivation

'(Deci, (1980)), student voice (Rudduck and Flutter, (2004)); as well as, our own studies (Nicholl, McLellan and Kotob, (2008); McLellan and Nicholl, (2008)).

## Research Process

To try to understand the role of the technicians in supporting teachers at the difficult time of change, six technicians and six Creative Co-ordinators (CC) from the participating schools were interviewed. There were five male and one female technicians. Interviews were semi-structured and lasted approximately 45 minutes. The data were triangulated by two other sources:

i) field notes taken during the research team's visits to the schools and ii) lesson observation notes. The data were analysed using Nvivo and a coding frame was devised from the literature on changing practice, creative climates, and leadership for change, as discussed above.

## Emerging Themes

During the data analysis a number of issues emerged. These could be divided into three main themes: i) redefining the technician's role in order to support change in the D&T department, ii) supporting the technician through this process of redefinition and iii) the technician's role in encouraging or hindering a creative climate in the D&T lessons.

It became clear that technicians needed to redefine their roles to be supportive to teachers during the process of change, yet this would only take place if technicians were involved in the change process from its outset. If these two conditions were met, the result was that technicians supported and facilitated students' creativity.

## Redefining the Technician's Role

The data revealed that in schools where the HoD endorses the project (either because they are also the CC or because they believed in it) the technician's role went through a process of redefinition. When the technicians in these schools were asked to describe their role, they gave examples of how this role has changed from a rigidly technical one— being told precisely what materials to prepare for each task— to a role that allowed them more decision taking and more involvement through providing pupils with choice of materials during the design and the making tasks; the following excerpt illustrates this point:

*"Whereas before the teacher would say 'I am doing that project next', I'd flip a box and say there we go... I'd cut 250 pieces for one project; it is a lazy way of working but it isn't hugely inspiring..."*

*"If I wanted to go and work on a production line, I would have; that was almost the equivalent" (T/School A)<sup>1</sup>.*

Furthermore, this technician's role changed from one of preparing materials to one where she was encouraged by the CC to offer suggestions relevant to the nature of creative tasks.

*"It's a Time project now instead of clock project...to try and... I bought some sand-timers, little egg-timers to try and... yeah, it was my suggestion... Look, they're the same price as the clock mechanisms, so why don't we use them..." (T/ School A).*

Given this newly defined role, the technician in this school thought it actually improved the quality of her work life; she positively enjoyed it and was far more motivated as this excerpt reveals:

*"I'll quite often be in a conversation - you know, we'll be talking about stuff and say, why don't you try this, why don't you try that?... we could do it this way. And if you've got the technician... the technical person just being purely technical you'll end up in some very dull, boring job... you get stuck in a rut. Whereas if you're being creative, just life's more interesting, I think." (T/ School A)*

It is of no surprise that in schools where there was minimal or no change in teachers' pedagogical practices with respect to the project's aims, the technician was also unaware of the project's creative aims and prescribed to the more traditional description of his/her role. The following quote is typical of this role:

*"...making sure any materials they need are ready in time. Making sure the tools that they use are in good order. You know like the chisels are sharp and the planes are sharp." (T/ School B).*

Therefore, if the teachers are to be encouraged to use the project approach which at its core is autonomy, choice, freedom, and risk-taking, the technician's role needs to be redefined; it can not be the traditional role of "I cut the material up and put it on the shelf"; it needs to develop into "I find alternative material, alternative ways to doing things".

<sup>1</sup> For anonymity purposes schools were assigned letters to identify them to the research team. T stands for technician and CC for Creative Co-ordinator.

Technicians need to understand the importance of their role in developing students' creativity and, to accomplish this, they need to be involved in the process of change: to understand its dimensions and implications and to overcome the role of "squelcher"; this is what will be discussed in the next section.

### Supporting the Technician Through this Process of Redefinition

For technicians to redefine their role in the D&T department, they need to be involved from day one. The data revealed that where the CCs engaged with the technicians through informing, clarifying and consulting, the technician was able to redefine his/her role in a more successful way and with much less frustration and stress. The process of change need not be a formal approach but can be done in an informal and ongoing communication process. The data analysis highlights the importance of communication, including identifying problems, clarifying objectives and goals and engaging the technician in the change process to ensure his/her support for the teachers. The following quote is a good example of how a technician learnt about the project and became a source of support for the teachers:

*"I go in and see [the CC] every morning when I arrive to work... And we work together. She will come and talk to me about things if she is not sure... Quite often she will bounce ideas off me. She always tells me what is happening. What do I think about this? We tend to have informal chats. We don't tend to have meetings but we might suddenly find... like when we send for new equipment it is me and her that are unpacking it going 'Oh what do you reckon. Oh what shall we...'" (T/ School A).*

The technicians also need to be encouraged to attend department meetings where changes are discussed and to participate in training days where the approach is introduced. This kind of involvement will help the technicians to appreciate the essential role that they can play in supporting the department teachers to implement the necessary changes.

Another example of the importance of redefining the technician's role is the following example of a board that was prepared by one of the technicians in the participating schools. The board exemplifies to students how a material, in this case aluminium, can be manipulated in diverse ways rather than prescribing one way for them to follow. The technician here understood the importance of providing choice for students to develop their creativity and this board was one of the ways that demonstrates his understanding of ways to develop student creativity.

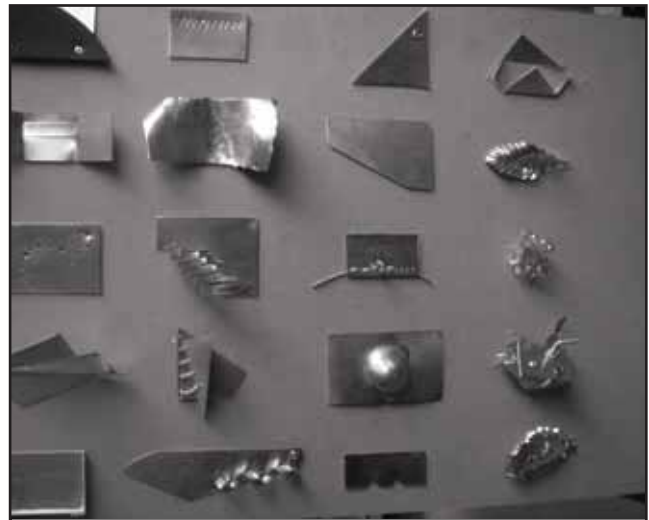


Figure 1 – Aluminium Sample Board

The above examples (see Fig1) show that the support of the department technician can impact the teachers' adoption of the creative approach, their practice in the classroom and ultimately pupils' creative learning. One CC explicitly explains the importance of this support:

*"I certainly value [the department technician], he is very important... he could make life very difficult for all of us... [especially] if he is inflexible." (CC/ School F).*

Therefore, it is crucial to include technicians and to get them to be part of the change. It is also important to recognize the things they have to offer 'Yukl, (2006)' and to get them involved in classrooms. The result will be that they understand the aims of the change and they provide the necessary support both to teachers and students.

### The Technician's Role in Encouraging or Hindering a Creative Climate in the Design and Technology Lessons

All six technicians interviewed stated that they were sometimes asked by the teachers to go into the classrooms during certain lessons in order to assist students while executing their projects. However, if the technician didn't understand the notion of a creative climate, he/she could unwittingly hinder the students' creative thinking and creative designing by giving them advice such as:

*"Yeah, I tend to say to [the students] 'If you're making something don't complicate it... if you make a simple design it's easier for you to make, the quality is that much better and it looks more presentable.'" T/ School C).*

*"Some of them... they have these grand ideas, what they put on paper and I say 'well, how are you gonna make that?' (T/ School D).*

This kind of critical feedback, early on when generating ideas, could discourage students from experimenting and taking risks which are essential characteristics for developing students' creativity (Ekval, (1983)). When students are asked to "keep things simple" or to avoid "grand ideas", they will be discouraged from exploring and experimenting and as a result feel unsafe to take risks.

However, in the schools where the technician is informed about the necessary attributes of a creative climate he/she could encourage students to take risks and to experiment with different materials, as this technician explains:

*"[In this project] we are playing with plastic and with acrylic... we are not trying to produce finished products... I say to them 'you cannot go wrong; you are having fun with it; you cannot go wrong.'" (T/School A)*

In one of the schools where we observed lessons, the technician was encouraging the pupils to develop their own sample boards(see fig2) of materials and to experiment with different ways of joining; the following is an example of a board constructed through pupils' exploration and play:

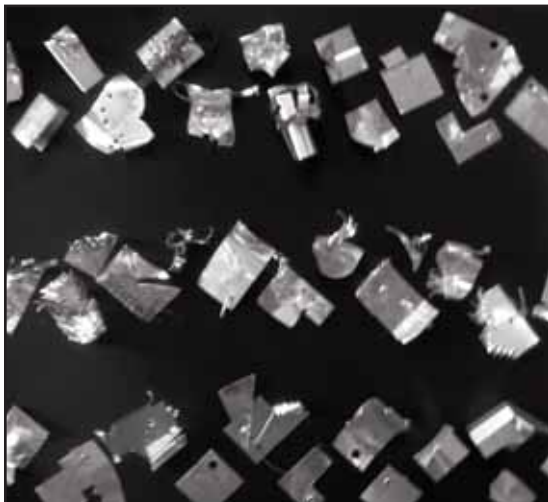


Figure 2 – 'Exploration and Play' Sample Board

By encouraging a climate conducive to creativity the technician will also be supporting the teacher, not necessarily by "preparing the materials" but by encouraging students to play and explore and look for possibilities in their design work.

## Conclusions

The results, which were illustrated above, shed some light on the importance of engaging the technician from the onset of change to ensure his/her support to the teachers. Teachers trying to change their teaching practices will need as much support as possible 'McLaughlin in Hargreaves & Evans, (1997); McLaughlin and Talbert, (2001)' and the technician is one member of the department who works closest to the teachers on a day to day basis, hence could be a major source of support.

Although, traditionally, the technician has been regarded as the person providing technical support, his/her role needs to be enhanced; especially that today much research refers to teacher workload and its impact on teachers and teaching (Hammersley-Fletcher, (2007)). We argue that, if technicians are part of this change from the outset, they will see that their role is pivotal in supporting teachers in affecting change and ultimately they will aid in creating a classroom climate which allows students to reach their creative potential.

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