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Digital Skills and Motivation in Young People in Transition

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Abstract. This paper explores the underlying assumptions that are often made concerning the beneficial impact of the use of Digital Technologies in relation to the motivation for academic work, and related forms of engagement. In particular, these claims are assessed in the context of an overarching concern with the motivational characteristics that are most likely to abet the effective transition of young people from one context to another. In this light, relevant theories of motivation are explored together with an assessment of how they might, together, provide a more productive basis for the development of the role of Digital Technology in assisting the making of effective transitions.

Keywords: Transition, motivation, digital technologies.

1 Introduction

This paper is part of a set concerned with the potential beneficial role of Digital Technologies (DTs) in assisting young people to progress through the transitional points in their lives. Other papers in this section will focus upon the nature of transition itself and will help to scope the various ways in which DTs might help. It will be readily apparent that there are a number of ways in which DTs might assist, or indeed hinder, transition. The ability of DTs to package, transmit and provide in timely manner relevant information will be an important part of the process. Providing information is one thing, making effective use of it is another. Information is likely to be accessed and used effectively as a function of the motivation of an individual to do just that. Transitions themselves are likely to be demanding and to present challenges that will require a sufficient degree of motivation to be met effectively. As will be discussed in greater detail below, it has been argued (or perhaps asserted) that DTs have the capacity to influence the motivation of people, young people particularly. Perhaps then DTs can not only provide informational support, but might also have a positive impact on the very nature of the motivation that young people can bring to the transitions they face.

This paper, then, sets out to review and consider the options that might be available to us in considering the role of DTs in influencing the nature of motivation. There is a particular focus on the need to understand the requirements concerning the development of motivational styles that will help to enable young people to manage, in both a fluid and a productive manner the transitions that are a necessary part of study and work. There are, as shall be seen, many claims for the power of DTs to have a transformational impact upon the motivation of students. These claims

however are generally based upon a non-theorised construct of motivation and thus the nature of the claims themselves remains uncertain. There are clear indications that a concern with the fundamental nature of motivation is often confused with the more immediate and, sometimes, superficial construct of interest. However, it is also clear that there remains a very considerable potential for the use of DTs in the development of more effective and adaptive forms of motivation. This potential is demonstrated by the clear plasticity of motivational characteristics.

The paper essentially concerns two issues. The first is a broad, and necessarily brief, account of the desiderata in relation to effective forms of motivation in transitional situations. The adopted approach involves the setting out of the key concerns of three important theories of motivation in learning contexts together with a demonstration of the issues that arise when transitions become the main focus. It is more typical for the theoretical focus to be upon a relatively static phase of the educational process. The overview will emphasise the essential plasticity of motivation and thereby the considerable potential for change and growth that such a view allows for.

The second point of focus will be a consideration of the claims that have been made for the motivational benefits of DTs. To anticipate the conclusion, whilst the theoretical potential remains high, the demonstrated gains are limited largely due to the essentially non-theorised ways in which motivation has been construed in the relevant studies.

2 Approaches to Motivation

Three well established theoretical approaches to motivation are introduced here to illustrate the range of concerns that any consideration of the motivational benefits of DTs should address. These theories are not exhaustive of the literature. More importantly they are presented here in the belief that rather than serving as competitors for our allegiance they could represent, in synthesis, a powerful set of tools for considering how DTs might help to develop a beneficial way of developing robustness and adaptiveness in transitional situations.

Self-determination theory [1] highlights the role played by the fundamental human needs of competence, autonomy and relatedness. In as much as these three needs are met by achievement strivings in particular settings, then an individual's motivation for the associated activities will be enhanced. Perhaps more importantly, work associated with this theory has highlighted the importance of, and the limitations of, intrinsic motivation. As an individual's needs are met, so intrinsic motivation is likely to be enhanced. Enhanced intrinsic motivation in turn leads to greater persistence and other adaptive approaches to learning. However, it becomes clear that high levels of intrinsic motivation are relatively rare, as all three sets of needs are unlikely to be simultaneously and unambiguously met in most of the situations we daily encounter. Therefore other forms of motivation, all essentially extrinsic, are identified. These extrinsic motivational forms range along a dimension of self-regulation. At one end of this dimension is "amotivation" (essentially disengagement) followed by "external", "introjected", "identified" and "integrated" regulation in turn. External regulation finds an individual doing things because they see themselves as being under the

control of others. Through the development of integrated regulation an individual imposes a sense of self-discipline in order to carry out activities leading to an outcome which they personally value. They undertake these things, not simply or necessarily because they enjoy them - they may well not – but because they recognise that a “person like them” would wish to achieve what those activities might lead to.

This elaboration of the simple distinction between intrinsic and extrinsic motivation is one that has essential implications for DT related research. The simplistic notion that DTs will enhance motivation through making activities more “enjoyable” and thereby adding to any intrinsic motivation already associated with the task is replaced by a need to seek ways of deploying DTs to develop more self-regulated motivational forms. Crucially this approach can recognise that learning is not, and probably cannot, always be intrinsically enjoyable. Many activities, where engagement is strong with a clear focus on success, will not be enjoyed, but the actor will persist. Self-regulated motivation becomes particularly important when people find that a transition has left them losing some of the enjoyable aspects of the core activity, for example the transition from school to university [2].

A second approach to attend to is that of Future Time Perspective (FTP) [3]. While less well known and, in its entirety, less well researched than the other two theoretical systems discussed here, FTP offers an integration of approaches, concerns and ideas that ought to make it essential reading for those interested in developing motivation through the use of DTs. While ultimately complex, the theory posits a division between two time frames each of which has implications for an individual’s motivation. The time frames focus upon both future oriented and proximal self-regulation. The former encompasses the generation of a personal value system stemming from the individual’s sociocultural context. When linked to their knowledge of what might be possible, this gives rise to a set of personally valued goals with a matching system of proximal subgoals (the steps that need to be taken to reach the defined goals). These feed through into the proximal system concerned with the regulation of current activity, relevant facets of which include the perceived value of the current task, the link between the value of the current task and the individual’s longer term aims, their level of self-efficacy for the present task and the eventual link back to a more enduring self-concept of ability that influences the ongoing development of long-term values and goals.

A key point here is that the individual cannot be isolated from either the context within which they presently work, or the greater context (spatially, temporally and culturally) within which that present context is embedded. In short, school, let alone the use of DTs in school, has its limits when set against the substantial legacy of an individual’s sociocultural context. Students’ present values, interest levels and self-efficacy levels cannot be separated from their longer-term values, goals and the more enduring aspects of their self-concept. Against such a model, many of the studies claiming motivational benefit for DTs are shown as merely engaging with one very small part of the overall process. More importantly, it is possible to argue that these contributions may be classified as “quick fixes” rather than as attempts to bring about enduring changes in the longer-term motivational characteristics of a person.

The final, and most significant, approach is motivational goal theory [4, 5, 6, 7]. Goal theory has recognised the existence of two primary motivational goals, each of which is found in two varieties. While there are differences in nomenclature and

differences of potential importance concerning the use of measuring instruments [8] there is a general consensus concerning the broad definitions of the principal characteristics of learning goals and performance goals. Learning goals provide a focus upon individual progress with movement towards the obtaining of a higher level of expertise being central. Performance goals are concerned with a display of competence with this often, but not always, being demonstrated through relatively high levels of performance in comparison to members of a peer group.

Each of these goals is held to operate in either an approach or an avoidance mode. This second dimension, which together with the first provides the basis for what is referred to as the '2 x 2' model of motivational goals, is more clearly understood in relation to the operation of performance goals. To illustrate: an individual with a strong performance approach goal will be likely to relish opportunities of demonstrating high levels of competence in relatively public ways. They are likely to enjoy the opportunities provided by competition, will be willing to undertake activities in seminar rooms and in school classrooms which allow for the demonstration of competence and will relish the opportunity to receive feedback about their performance. Conversely, an individual with a clear performance avoidance goal will have a more "fearful" approach to their learning and study. In these cases, rather than perceiving the opportunities that success might provide for gaining positive feedback, the focus is likely to be upon the opposite side of the coin. In other words, the opportunities to fail and therefore receive feedback confirming a lack of competence become the focus of attention. Individuals with strong performance avoidance goals are therefore often seen to engage in a range of avoidance strategies each of which can be understood as being designed to protect the individual from the consequences of an anticipated failure. However, at the same time, those strategies risk minimising the learning opportunities present. One example of this concerns the adoption of "effort avoidance" strategies which enable the individual to anticipate being able to explain any actual failure by the absence of effort rather than by the absence of ability. The focus upon this particular defensive strategy owes a great deal to the contribution of Dweck to the development of goal theory and her explication of the differences between incremental and entity views of the nature of ability [9, 10].

The differences between learning approach and learning avoidance goals [11] have received less attention and have probably, to date, been regarded as possessing less practical usefulness. However, the same basic concern is again evident with individuals who are strong in learning approach goals seeking out opportunities to engage in activities that might lead to the demonstration of improvement and learning. Learning avoidance goals are concerned with the again somewhat fearful desire to avoid the demonstration that one has failed to learn or to improve. This is perhaps most readily understood when applied to groups of people whose learning capacity may be challenged through the ageing process or by any onset of some other potentially disabling incapacity. Interestingly, people in the early stages of a transition might also find learning avoidance goals heightened.

Elliot [6] draws attention to the ways in which the goals that have been adopted by an individual will have a critical influence upon the ways in which the nature of success (and thereby failure) are defined. Learning goals define success in terms of progress while performance goals do so in more normative terms. All motivation

theories, rather self-evidently, share a concern with people's responses to success and failure. The identification of the role of goals in defining the ways in which success might be understood is therefore highly important. If experiences can shape goals so they will also shape the very meaning of what it is to be successful.

Even for readers lacking in any prior familiarity with these concepts, it is probably apparent that approach goals will generally be perceived as being motivationally beneficial in comparison to avoidance goals. Learning goals would similarly be identified as preferable to performance goals. While there is little equivocation in the literature regarding the limitations of avoidance goals, the advantages of learning goals over performance goals, particularly in respect to higher education, have not always been quite so apparent [e.g. 12]. However the point to be explored here is to do with the changes that are regularly identified in the dominant motivational goal patterns displayed by students as they progress through their years of study, with higher education providing the examples.

3 Motivational Plasticity

Remedios et al. [13] provide an illustration not only of some of the changes within individuals over time that have been observed in earlier research, but also draw attention to the important impact of culture, and indeed a changing culture, upon these trends. Their review of earlier work draws attention to research showing that United Kingdom (UK) university students will be likely to begin their studies with relatively strong learning goals but will see a gradual increase in the relative strength of performance goals as time progresses. They also illustrate how students in other cultures, specifically Russia or the Soviet Union, have been shown to be more likely to maintain the initial levels of learning goals. The work was designed not only to test for the continuation of these trends in the UK but to investigate the extent to which cultural changes in Russia since the dissolution of the Union of Soviet Socialist Republics (USSR) might be associated with changes to the students' motivational patterns. Their results confirm a continuation of the established trends in the UK and also suggest that in post-USSR Russia the motivational trends are now much more like those found in the UK.

With a clearer focus upon the transition into higher education, further illustrations of the way in which context can have an impact upon the motivational characteristics displayed by students can be found in work currently being undertaken by Rogers [14, 15]. This work is examining the possibility that the '2 x 2' motivational goal model outlined above might not be adequate to capture fully the range of motivational goals employed by students as they enter higher education. This work posits "Performativity" as an additional motivational goal, and also as one which may be of particular importance in helping us to understand some of the difficulties that many students in the UK seem to experience upon moving from school to university.

In England, for those students intending to enter university, the last two years of schooling are characterised by an intense focus upon the qualifications that they will gain as they leave school - the General Certificate of Secondary Education (GCSE) Advanced level, commonly referred to as A-level. Admission into university is dependent upon the grades achieved in these qualifications (A-levels being scored

from a top A* to the lowest pass grade of E). High status universities in England will typically be requiring students to obtain three A-levels at or around A-grade standard in order to gain admission.

Consequently, schools find themselves under considerable pressure to give their students the maximum possible support in achieving those grades. Such pressure is argued to lead to an intense form of “teaching to the test” with the provision of a very high degree of learning support and structure. While such teaching strategies have been highly successful in producing a remarkable continuation of year-on-year increases in the proportion of students obtaining those high grades (until the last two years, writing just prior to the publication of the 2014 results), Rogers [14] argues that this leads to the adoption of an approach to learning by students that makes it very difficult for them to develop the characteristics of the “independent learner” that are seen by many as a central part of the full development of graduate capabilities.

For present purposes the concern is to simply illustrate the ways in which various aspects of the culture within which an individual is studying can have a notable effect upon the development of their pattern of motivational goals, their motivational style. Variations in culture can be very much: at the micro level - what is happening in one particular school classroom; at a meso level – the influence of one particular national assessment regime; or at the macro level - changes in a broad pattern of values and expectations coming about as the result of a major social and political upheaval.

In any event the culturally determined environment in which a student is working will impose its own particular set of demands. For some time [e.g. 17, 18] motivation theorists have been suggesting that it is unhelpful to categorise motivational styles as simply good or bad, strong or weak. Instead it has been argued that they are more usefully and productively categorised as adaptive or maladaptive. Some of the key derivatives of this assertion are that:

- a) in making any judgement about how adaptive a particular motivational style might be, it will always be necessary to specify what it is that a given style might be adapted to;
- b) a style that might be highly adaptive in one situation may well not be in another;
- c) when we consider the multifaceted nature of many cultural contexts the precise focus of the adaptation may not be immediately apparent.

As a consequence, although school teachers may genuinely aim to develop the characteristics of independent learning prized in the university context, and of course elsewhere, the pressurised environment in which both they and their students have to work will lead to the adaptive formation of performativity goals. As the transition to university is undertaken, the student is likely to find that those same performativity goals that had served them very well as they worked to achieve their high A-level grades were now no longer adaptive to their new environment and its somewhat different set of concerns. The holder of those goals may well however not be among the first to notice this lack of adaptiveness.

In this light, it might be argued that there is no such thing as the best combination of motivational goals in any absolute sense. Instead there is a need to consider both short-term and long-term consequences of the adoption of any particular motivational style and then strive to develop those styles that are most likely to give an adaptive benefit. The difficulty for a teacher of A-levels in England is that there appears to be a conflict between the benefits gained in the short-term (high grades) and in the long-

term (better eventual transition into university). Successful transitions then, from a motivational perspective, are not necessarily about beginning with the “right” type of motivation. They will be more to do with the ability of all parties involved to be aware of, and to appropriately respond to, the changing adaptive demands as the transition is carried out.

As we now shift our attention to a consideration of the impact of DTs upon the development of motivational style, it is clear that the same concerns with the balance of the consideration of the impact of the present context, the observation of any apparent short-term gain, and the prediction of any claimed long-term gain remain. In considering the potential of DTs to enhance motivation we need to be asking clear questions concerning the criteria that we would use to identify change, to assess the desirability of that change and to determine primarily where the adaptive focus of developed motivational styles might lie. There is also a pressing need to highlight the importance of individuals being able to develop insight into and thereby some possible control over their own motivational characteristics.

4 Digital Technologies and Motivational Development

A full review of the claims made by researchers concerned with DTs is beyond the scope of this article. A useful starting point is provided by a review for Becta [19] which indicates the range of impacts illustrated by research. Motivation emerges as the area where positive impacts are most unambiguously and consistently reported. The following captures the claims: “At present the evidence on attainment is somewhat inconsistent, although it does appear that, in some contexts, with some pupils, in some disciplines, attainment has been enhanced. ... The body of evidence on the impact of ICT on intermediate outcomes, such as motivation, engagement with and independence in learning, is greater and more persuasive” (p.4). Results for attainment are qualified; those for motivation are not.

Given the significance that is ascribed to motivation within the learning process [20] the conclusion that DTs may enhance classroom motivation is important. However, without clarity concerning the nature of the evidence base for the claim, including a concern with definition, moves to policy and practice development may be premature.

A representative sample of studies cited by Condie et al. [19] supporting the claim that DTs have positive motivational impact will now be examined. The prime concern will be to examine the models of motivation, both explicit and (more typically) implicit that have been deployed in those studies, alongside a consideration of the methods employed.

5 Forms of Motivational Impact

Motivational enhancement is taken to be an unproblematic concept in the clear majority of the studies covered by Condie et al. and indeed in the review itself. However, it is possible to deduce a number of formulations that authors largely implicitly draw upon. The following are the main examples. Throughout the

following discussion the focus is upon the possible impact of DTs upon motivation for the associated subject of study. This is importantly different from the development of motivation for the use of DTs themselves.

Emerging initially from references to the development of micro-computing technology during the 1980s and 1990s, DTs are seen to have an inherent ability to capture and hold attention. This derives from the novelty value or other properties of the DT forms themselves. As engagement with the technology is, apparently, tied to engagement with the associated tasks, DTs can draw in and “hook” students. One form of enhancement I therefore identify as the “hook model”. “Hooking” students in this way will be dependent upon the continuing presence of elements within DT platforms that are sufficiently intrinsically interesting to provide the hook. In as much as these are often dependent upon the novelty value and superior “power” of the technology (in comparison to instances used elsewhere by the student) the success of the hook model may be relatively short-lived. These forms of influence will also be dependent upon the level of interest that individual students may show in the technology. So one might expect to find that some students (e.g. boys), are more influenced than others (e.g. girls), by the particular DTs on offer. More importantly, the hook model may be limited to providing an initial motivational impact that is dependent upon a continuing technological presence.

Condie et al.’s review progresses to indicate that current DT school usage is characterised by “collaborative, investigative and problem solving activities” (p.21). The emphasis now shifts from the direct level of interest that students may have in the technology to ways in which the application of technology influences the students’ classroom interactions. On occasion, such changes in interaction patterns would be the result of something as straightforward as the DT resource level, with limited resources requiring some degree of sharing. With technological progression, forms of interaction can be more directly influenced by DTs. Interactive whiteboards, one of the more researched technological forms, can promote patterns of interaction within a whole class, while multi-touch technologies can promote smaller group-based interactions (see [21] for an example that postdates the Condie et al. review). Within this approach, any motivational effects of DTs are indirect and may be achievable without the use of those DTs. If increased collaboration enhances motivation, then any way of increasing collaboration may produce the effect. Such broad models of motivational enhancement I refer to as “interactive models”.

The “interactive” model can be subdivided. One variant shares elements of the “hook” model. Rather than DTs providing the initial and (possibly) the ongoing reason to engage with the activity at all, it is the collaboration and the consequentially more rewarding interactions with peers that fulfil this function. DTs help to structure the nature of the interactions and, if these become more rewarding, the student becomes more likely to remain engaged with the activity and is thereby held to be more motivated.

A second variant focuses on the cognitive gains that often follow from greater collaboration [e.g. 22]. In as much as the evidence shows attainment gains under conditions of enhanced collaboration, the introduction of DTs, in as much as it enhances collaboration, will thereby enhance attainment. The link to motivation then comes through enhanced feelings of competence and raised levels of self-efficacy. These aspects of the motivational process are discussed further below, but for now I

note that DTs would have an indirect influence upon motivation and that it would be a consequence of raised attainment levels rather than a cause.

Finally Condie et al. discuss the nature of the research they have reviewed and the longer-term prospects concerning DTs' impact on learning. They anticipate the point when any particular form of DT's deployment in school will be normal and fully embedded. They intimate that the greatest potential for DTs is, therefore, still in the future. While this will in part have something to do with the development of ever more powerful, mobile and well-designed technological forms, their prime concern is the embeddedness of DTs in a permanently changed set of teaching practices. One may go on to draw upon the self-efficacy literature [23] to suggest that more effective teaching, in as much as it leads to more effective learning, will then enhance student self-efficacy, thus setting up a beneficial cycle influencing students' motivation. Enhanced motivation then plays its part in generating further enhancements in attainment and so forth. Such a model, which I refer to as the "cyclic model" assumes that the impact of DTs on motivation will be long-term, indirect, subtle and ultimately self-sustaining.

From this initial summary, a number of alternative models emerge of the ways in which DTs' use might affect motivation development:

- a) DTs' use is seen as something that (some) students will find intrinsically interesting. This intrinsic interest provides a form of motivation that is additional to whatever else motivates the students to engage in the given activity. With all other things assumed to be more or less equal, this increased engagement leads to more effective participation and higher attainment.
- b) The use of DTs changes the ways in which students interact with the task and with each other. This in turn makes the activity more intrinsically interesting and therefore adds to the sum total of motivation to engage. The increased motivation leads to more prolonged engagement ultimately leading to greater attainment.
- c) The use of DTs changes the ways in which students engage with each other and with the task. Primarily as a result of these variations in the form, rather than the duration, of task engagement, student attainment in key aspects of the task increases. Increased success eventually raises motivation for further engagement.

The difference between b) and c) above may at first appear subtle, but is of potential significance. The former promotes change through a "more of the same" strategy. The cognitive aspects of the students' work are constant but they may engage for longer and with greater intensity. The latter model, c), highlights changes in the form of student cognition which then lead to more effective learning and higher attainment. If higher attainment also helps to develop and sustain motivation to engage with the task, then a beneficial cycle can be established.

The Condie et al. review primarily discusses motivation as an intermediary variable (operating between initial task presentation and attainment). This is a common way of conceptualising motivation and indeed largely accounts for the perennial interest shown by educators and researchers alike in the phenomenon. Attainment gains during the present phase of education are the prime target. However, it is also possible to conceive of motivation as the target variable. A distinction can thus be made between the potential for DTs to impact upon motivation so to enhance present levels of attainment, or to act as a spur to the development of "better" motivation in the longer term. Short-term attainment gains would not necessarily be a

consequence of this latter approach. The longer-term perspective depends upon the adoption of a model of motivation which recognises motivation as possessing elements of a skill – a view established in motivation theory some while ago but not always fully reflected in other literatures that refer to motivation [17]. This is considered to be a vital distinction in the present context. On the assumption that motivation development has adaptive features, then a drive to enhance motivation in order to bring about gains in attainment in the relatively short-term is likely to be associated with motivational developments that also fit with that context. When we are concerned with high stakes (indeed very high stakes) attainment outcomes then the associated motivational characteristics are possibly going to prove to be very deeply ingrained. This raises the possibility of motivational styles developing that are indeed well suited to current concerns but are also poorly adapted to future environments and at the same time difficult to change.

6 The Evidence Base

The above comments suggest that we need to be very careful in considering claims that might be made in respect to the impact of DTs upon motivation. This is particularly likely to be the case when the role of motivation in transition situations is the focus of concern. However, it is also necessary to take a closer look at the evidence base for the claim that DTs might be able to exercise any significant impact upon motivation in the first place. An examination of a sample of the studies that have been implicated in the claim that DTs can have a beneficial impact upon motivation follows.

The Impact2 project [26] provided a focus on the effects of networked technologies. As with the predecessor study [27], the focus of attention was on the influence of DTs on attainment. The project aimed to identify the relationship between degrees of DT use and performance in the National Curriculum at Key Stages 2 to 4 (for students aged 7 to 16 years). Assessing the academic progress made by students revealed a consistent, but often small and statistically insignificant, advantage for those students with higher levels of DT use. Variations across curricula area were identified, and these variations were themselves found to co-vary with age.

Motivational consequences were addressed via information gathered from interviews and observations. A consideration of the claims made from these data show a fit with the categories identified above. DTs are seen as intrinsically interesting - they all “want to go on the computer”. The use of DTs is also seen to improve the level of performance and thus increases satisfaction and motivation. In as much as the use of the computer speeds up the process of getting the work done, there is more time available for student reflection. However, it remains unclear as to which of these pathways, and possibly others, were responsible for any actual changes in motivation. More importantly, it is unclear just what “motivation” is taken to be. Finally, it is important to note the marked difference between the claims made for the effects of DTs in respect to attainment and then motivation. While it is unlikely that the Impact2 authors would wish to defend a claim that DTs have uniform and entirely consistent motivational effects across the National Curriculum and age ranges, nevertheless the claims for motivational impact are presented as being much more

ubiquitous than those for attainment. With attainment the outcomes are clearly context specific, whereas similar qualifications on the impact of motivation are less evident. In part this is simply a reflection of the relative degree of attention paid by the researchers to each. However, it also reflects the dependency on relatively undifferentiated, undefined and unchallenged teacher perceptions of motivational effects.

Torgerson and Zhu [28], using the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) methodology in their review concerning the impact of DTs on literacy learning in English for 5- to 16-year-olds, offers the overall conclusion that “Policy-makers should refrain from any further investment in ICT and literacy until at least one large and rigorously designed randomised trial has shown it to be effective in increasing literacy outcomes” (p.9). This essentially neutral but cautious conclusion is concerned with the impact on attainment. The authors make the point that some studies (often used by government agencies to support the development of DT usage in schools) are not suited to the making of any causal claims as they only employ observational or correlational data. The impact of other factors that might be associated with “high” ICT use may well be responsible for the positive associations observed.

Torgerson and Zhu [28] include in their analysis, studies that claimed to have investigated the effects of DTs upon reading attitude and attributions. While the review does not explicitly draw out the measured impact of DTs upon motivation, the conclusion is as for attainment effects. There would appear to be no existing study that has targeted the impact of DTs upon motivation that would meet the conditions that Torgerson and Zhu require. Reasons for this will include the lack of clearly agreed measures and definitions.

Further studies add support to the suggestion that students find materials mediated by DTs to be interesting [29], a view clearly shared by parents with regard to engagement in homework [30], and that the use of DTs can provoke teachers to reflect upon their pedagogic practices and so develop more collaborative working [31]. Each of these studies, and the others that they are selected to represent, generally fail to offer any precise definition of motivation. Any unique contribution of DTs to the enhancement of motivation is far from being identified.

According to Condie et al. the “most significant study to date on the motivational effect of ICT on pupils” is a project carried out for the then DfES [32]. According to Condie and Munro, this research is one of very few to draw explicitly upon motivational theory and to attempt to develop a quantitative set of measures rather than relying solely upon teacher or other reports of motivational effects.

The Passey and Rogers’ research constructed a multi-dimensional model of “adaptive” motivation drawing upon a number of strands from motivation theory. These included goal theory [7] and self-determination theory [1]. Working from these positions, Passey and Rogers constructed “adaptive” and “maladaptive” motivational profiles. Measurements were obtained of the profiles of students in a number of schools identified as exemplars of ‘good DT practice’. Condie and Munro state that “...the forms of motivation associated with [information and communication technologies] ICT use were concerned with learning rather than mere task completion and, when using ICT, pupils perceived their classrooms to be very focused on the process of learning”. Passey and Rogers concluded that using DTs helped to draw

pupils into more positive modes of motivation and could offer a means by which pupils could envisage success. All of the secondary school teachers involved felt that DTs had a positive impact on pupil interest in, and attitudes to, schoolwork.

A fuller reading of the original research leads to some important caveats. Primarily the Passey and Rogers study was correlational in nature. As such it would fail to meet the requirements set out by Torgerson and Zhu [28]. Nevertheless, the Passey and Rogers model is one of the very few that attempts to go beyond “taken for granted” or “common-sense” definitions of motivation.

This summary of highlighted studies leads to the following observations. There is a generally held, and typically unchallenged, view that the use of DTs in classrooms has motivational benefits. Precisely what this may mean however is another matter. In some cases the implication is that the use of DTs themselves is something that students enjoy and they are therefore willing to spend time engaging with them and thereby with the associated academic work. This means relatively little when it comes to making claims that student motivation for learning any specific aspect of the school curriculum might be enhanced. Nonetheless, DTs may have the capacity to add to the sum total of whatever is motivating students to engage. DTs can also have an impact upon pedagogic practices and may enhance the use of collaborative processes, generally regarded as having positive motivational benefits [22]. In order to achieve these benefits however, the proactive and regulating role of the teacher remains essential. Finally, while motivation is generally undefined, it is considered to be an intermediary variable helping to determine attainment levels as distinct from an objective of development itself.

7 Conclusion

If we are to be able to offer a coherent position on the ways in which DTs may help with the development of more effective motivation in young people experiencing important life transitions, then a clear understanding of the nature of motivation in those situations is needed. Motivation research has tended to concern itself with the nature of motivation in given contexts or to examine the degree of fit with the “far” side of the transition for those characteristics developed on the “near” side. Concern with the process of transition has been limited. Three major theoretical positions in motivation (goal theory, self-determination theory and future time perspective) have been introduced. In short, these three central approaches to the conceptualisation of motivation move us away from conceptualising motivation as something that operates only in the here and now of the particular classroom activity and relocates it as an essential part of the total organic experience of the individual student. Clearly it does not follow from this that only interventions or changes to classroom practice that address all relevant aspects of the individual equally and simultaneously can be recognised as genuine attempts. However, without a consideration as to how any single change in current practice might bring about such longer-term changes we will be left with an inadequate model of practice. Motivation has for some time been conceptualised as a skill [17] that needs to be developed and learned. Typical claims around the impact of DTs have generally deployed a less effective deficit model where the addition of DT inspired elements can make up for the motivational

inadequacies of a student. Such approaches can be severely limiting in that they generate a DT (or other “sweetener”) dependency that would do little if anything to truly enhance motivation.

A major objective of this review has been to highlight the importance of helping students to develop the skill of motivational self-regulation. As with many other aspects of human behaviour, motivational patterns will be characterised by a degree of adaptiveness to the relevant context. This is a powerful process and one that generally helps to ensure that people will develop appropriate motivational forms. However, if transitions bring about clear changes in relevant situational demands, then the adaptiveness of any particular pattern can be rapidly lost. The effective transition will then be one that will be marked by the re-adaptation of motivation. DTs may well have a role to play in this, but they are more likely to do so through the effective scaffolding of self-regulated change than through the provision of forms of “interest” to carry the student along.

References

1. Deci, E.L., Ryan, R.M. (eds.): Handbook of self-determination research. University of Rochester Press, Rochester, NY (2002)
2. BBC: Teaching 'better at school than university' - survey. [Retrieved August 16, 2014, from <http://www.bbc.co.uk/news/education-15150382>] (2011)
3. Miller, R.B., Brickman, S.J.: A model of future-oriented motivation and self-regulation. *Educational Psychology Review*, 16, 9-33 (2004)
4. Senko, C., Hulleman, C., Harackiewicz, J.M.: Achievement Goal Theory at the Crossroads: Old Controversies, Current Challenges, and New Directions. *Educational Psychologist*, 46, 26-47 (2011)
5. Maehr, M.L., Zusho, A.: Achievement goal theory: the past, present and future. In: Wentzel, K., Wigfield, A. (eds.) *Handbook of motivation at school*. Routledge, London (2009)
6. Elliot, A.J.: A conceptual history of the achievement goal construct. In: Elliot, A.J., Dweck, C.S. (eds.) *Handbook of competence and motivation*. The Guilford Press, London (2005)
7. Pintrich, P.R.: Multiple Goals, Multiple Pathways: The Role of Goal Orientation in Learning and Achievement. *Journal of Educational Psychology*, 92, 544-555 (2000)
8. Elliot, A.J., Murayama, K.: On the measurement of achievement goals: Critique, illustration, and application. *Journal of Educational Psychology*, 100, 613-628 (2008)
9. Dweck, C.S., Molden, D.C.: Self Theories: Their Impact on Competence Motivation and Acquisition. In: Elliot, A.J., Dweck, C.S. (eds.) *Handbook of Competence and Motivation*. The Guilford Press, London (2005)
10. Dweck, C.S.: *Self-theories: their role in motivation, personality, and development*. Psychology Press, Philadelphia, PA (1999)
11. Elliot, A.J., McGregor, H.: A 2x2 achievement goal framework. *Journal of Personality and Social Psychology*, 80, 501-519 (2001)
12. Durik, A.M., Lovejoy, C.M., Johnson, S.J.: A longitudinal study of achievement goals for college in general: Predicting cumulative GPA and diversity in course selection. *Contemporary Educational Psychology*, 34, 113-119 (2009)
13. Remedios, R., Kiseleva, Z., Elliott, J.G.: Goal orientations in Russian university students: from mastery to performance? *Educational Psychology*, 28, 677-691 (2008)

14. Rogers, C.G.: Transition, self-regulation, independent learning and goal theory. *Psychology of Education Review*, 36, 26-31 (2012)
15. Rogers, C.G.: The Vernon Wall Lecture: Psychology in education in a political world: Some thoughts on performativity in higher education. The British Psychological Society, Education Section Annual Conference, York (2013)
16. Elliot, A.J., Murayama, K., Pekrun, R.H.: A 3 x 2 achievement goal model. *Journal of Educational Psychology*, 103, 632-648 (2011)
17. Ames, C.: The enhancement of student motivation. In: Maehr, M.L., Kleiber, D.A. (eds.) *Advances in Motivation and Achievement: Volume 5. Enhancing Motivation*. JAI Press, Greenwich, CT (1987)
18. Ames, C.: Motivation: What teachers need to know. *Teachers College Record*, 91, 409-421 (1990)
19. Condie, R., Munro, B., with Seagreaves, L., Kenesson, S.: *The impact of ICT in Schools - a landscape review*. Becta, Coventry (2007)
20. Hattie, J.: *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge, London (2009)
21. Higgins, S., Mercier, E.: *Multi-touch technologies and motivation in the classroom*. BERA Annual Conference, Warwick (2010)
22. Blatchford, P., Baines, E., Rubie-Davies, C., Bassett, P., Chowne, A.: The Effect of a New Approach to Group Work on Pupil-Pupil and Teacher-Pupil Interactions. *Journal of Educational Psychology*, 98, 750-765 (2006)
23. Bandura, A.: *Guide for Constructing Self-Efficacy Scales. Self-Efficacy Beliefs of Adolescents*. Information Age Publishing, Charlotte, NC (2006)
24. Torff, B., Tirotta, R.: Interactive whiteboards produce small gains in elementary students' self-reported motivation in mathematics. *Computers & Education*, 54, 379-383 (2006)
25. Turel, Y.K.: An interactive whiteboard student survey: Development, validity and reliability. *Computers & Education*, 57, 2441-2450 (2011)
26. Harrison, C., Comber, C., Fisher, T., Haw, K., Lewin, C., Lunzer, E., McFarlane, A., Mavers, D., Scrimshaw, P., Somekh, B., Watling, R.: *ICT in schools. Research and Evaluation Series No. 7: The impact of information and communication technologies on pupil learning and attainment*. DfES and Becta, Nottingham and Coventry (2002)
27. Watson, D.M., Cox, M.J., Johnson, D.C.: *The Impact Report: An evaluation of the impact of Information Technology on children's achievements in primary and secondary schools*. Department for Education and King's College London, Centre for Educational Studies, London (1993)
28. Torgerson, C., Zhu, D.: *A systematic review and meta-analysis of the effectiveness of ICT on literacy learning in English, 5-16.*, Research Evidence in Education Library. EPPI-Centre Social Science Research Unit, Institute of Education, London (2003)
29. Livingston, K., Condie, R.: *Evaluation of Phase Two of the SCHOLAR Programme Final Report*. The Quality in Education Centre, University of Strathclyde, Glasgow (2004)
30. Valentine, G., Marsh, J., Pattie, C.: *Children and Young People's Home Use of ICT for Educational Purposes: The impact on Attainment at Key Stages 1-4*. DCFS, Nottingham (2005)
31. Hennessy, S., Deane, R., Ruthven, K.: *Emerging teacher strategies for supporting subject teaching and learning with ICT*. University of Cambridge Faculty of Education, Cambridge (2005)
32. Passey, D., Rogers, C.G., with Machell, J., McHugh, G.: *The Motivational Effect of ICT on Pupils*. DfES, Nottingham (2004)