Relations between Present-hedonistic and Future Time Perspective, Achievement Goal-orientation and Regulatory Strategy Use in Technology-rich Learning Environments

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Abstract

This cross-sectional explanatory study examines the predictive *mediational* relations between *time perspectives, achievement goals* and *regulatory strategy use* in high school students in the context of technology-rich, constructivist learning environments. The study adopts Bandura's (1986) social cognitive theory as its theoretical framework for the explaining the nature of predictive relations in the between the variables. Students *present-hedonistic time perspective (PHTP)*(α=.77), and *future* time perspective *(FTP)* (α=.79), were measured using Zimbardo and Boyd's (1999) ZTPI. The *mastery-approach (MA)* (α=.80), *performance-approach (PA)* (α=.86), achievement goals were measured with Pintrich et al.'s (1993) MSLQ and *regulatory strategy use (RSU)* (α=.74) with Midgley et al.'s (2000) PALS and Marshall's (2012) Tech-savvy Scale. Participants were 460 international high school students of mixed gender and ethnicity aged between 15 and 18 years. Data was analyzed using path analysis SEM and the model had good fit: *GFI* .909, *CFI*, .59 *SRMR*, .029 (*df*=4). *FTP* positively predicted *MA* and *PA*($p<0.05$). *PHTP* did not predict *MA* and *PA*($p>0.05$). *MA* and *PA* positively predicted *RSU* ($p<0.05$) and achievement goal orientations *mediate* relations between *FTP* and *RSU* ($p<0.05$). Results are discussed in light of the previous research and have implications in understanding the relationship between these constructs in technology-rich learning environments.

Keywords: time perspectives, achievement goals, regulatory strategy use

Introduction

There is an increasing use of digital technology by today's high school students. Using desktop, laptop and tablet computers to locate and process information in order to construct knowledge has become central part of the learning process in the constructivist classroom. The constructivist learning theory suggests that learning is most effective when students are actively engaged in the learning process rather than receiving knowledge passively. Constructivist teaching methods often use guided discovery where the teacher avoids direct instruction and leads the student through questions and activities to create their own understandings of the material. Digital technology is a useful tool for teachers and students to create a constructivist learning environment (Jonassen, 1999).

Students use their laptops and social networking sites extensively both inside and outside of academic contexts. The technology-rich environment offers students many opportunities for constructivist learning, such as quick access to information via the internet and the ability to instantly connect and communicate with their peers and teachers. However, digital technology it can also act as a distraction from academic work, for example through instant messaging and online gaming websites. Constructivist teachers take advantage of the benefits that digital technology brings to their classrooms, but more needs to be known about how students become more successful users of these digital technologies. More research is needed on how

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individual differences in the conceptions, motivations and behaviors of students in this type of learning environment impacts how effective students are in their use of digital technology in their learning.

A conception which relates student's motivations and behaviors is their notion of time, or *time perspective.* Zimbardo and Boyd (1999) conceptualize time perspectives as "continual flows of persona and social experiences are assigned into temporal categories, or time frames that help give order coherence and meaning to events" (p.1270). They propose that these 'cognitive frames' are used in the forming of expectations and goals. Zimbardo and Boyd state that "between the abstract, psychological constructions of prior, past and anticipated future events lies the concrete and empirically centered representation of the present" (p. 1272). Zimbardo and Boyd propose that a person's conceptualization of the present (their time perspective) influences the goals they set for the future. Time perspective influences many important judgments, decisions and actions and plays a "dynamic role in life decisions, goal setting and actions" (Zimbardo & Boyd, 1999, p. 1293). Prensky (2001) described today's students as 'digital natives' who have grown up in a technology-rich environment and have been interacting with digital technologies throughout their lives. Does these students conception of time influence their motivations for learning? Do their motivations influence the learning strategies they use with digital technology? This research study addresses the central question of 'how do student's time perspective and motivations relate to their learning behaviors in the context of technology-rich learning environments?'

Theoretical Framework

The research study is anchored in the social cognitive theory. Bandura's (1986) social cognitive theory conceptualizes human behavior as a dynamic interplay between *personal*, *behavioral* and *environmental* influences. Bandura proposes that we are not passive responders to the environment but are self-organizing, proactive, self-reflecting and self-regulating. The capacity to regulate ones thoughts, motivation, affect and action are central to students' academic functioning. Bandura's theory states that we are active in the construction of our realities and what we think, believe, and feel affects how we behave. The term *reciprocal determinism* was proposed by Bandura to explain how cognition, emotion, biological events, behavior and environmental influences interact and result in triadic reciprocity.

In the context of this study, time perspective and achievement goal orientation are *personal* factors which are influenced by the learning *environment.* The degree of self-regulation and control shown by students when using digital technology is a *behavior* (regulatory strategy use). These three factors relate to each other through triadic reciprocity because time perspective affects achievement goals which affect the students' regulatory strategy use. The student also receives feedback from their behavior, which influences their time perspective and motivation in a cyclical manner.

 ISSN 2094-1420

This study addresses this gap in the literature through the testing of a path model on predictive relations between time perspective, achievements goals and regulatory strategy use in technology-rich learning environments. The models presented in previous literature have not placed these constructs together and analyzed predictive relations between the variables within the specific context the technology-rich constructivist learning environment.

Time Perspective

The social cognitive theory connects time perspective to motivational and behavioral outcomes because the person's time perspective is a *personal* factor which varies between individuals and is based on prior experiences, vicarious reinforcement and feedback. Zimbardo and Boyd (1999) developed the Zimbardo Time Perspective Inventory (ZTPI) to measure this construct and their exploratory and confirmatory factor analysis revealed it to be a multi-dimensional constructs consisting of five factors.

This study addresses a gap in the literature by placing the construct in the context of the high school classroom and is particularly concerned with predictive relations between *present-hedonistic* and *future* time perspective, *achievement goal-orientation* and students *regulatory strategy use* whilst using digital technology in their learning. *Present-hedonistic* time perspective reflects a hedonistic, risk-taking, devil may care attitude towards time and life. These people tend to focus on the pleasure of the moment they are living. On the other hand, *future* time perspective reflects behavior that is dominated by striving for future goals and rewards (Zimbardo & Boyd, 1999). It is predicted that students with *future* time perspective are more likely to adopt approach (mastery/ task) achievement goals and are more self-regulated and controlled in their use of digital technology in their learning.

Achievement Goals

It is vital to understand the reasons why students engage in learning. In order to do this, this study adopts a modified version of the widely used and well-validated 2x2 achievement goal framework (Elliot and McGregor, 2001). Elliot and McGregor (2001) carried out an exploratory and confirmatory factor analysis with college students to develop their two *avoidance goal*s and two *approach goals*. The *mastery-approach* goal is where the student is focused on the development of competence through task mastery. The *mastery-avoidance* goal is where the student focuses on avoiding incompetent execution of tasks, such as failing to remember material, or making small mistakes when taking notes. The *performance-approach* goal is where the student seeks to demonstrate that they are more capable than their peers and the *performance-avoidance* goal is where students seek to avoid social judgments that they are less capable than their peers (Elliot, 1999). Since *performance-approach* and *mastery-approach* achievement goal orientations have

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been established as the most adaptive goals to adopt in academic environments the conceptual framework of this study will only include these two goal orientations(Lau et al. 2008; Liem et al. 2007).

Regulatory Strategy Use

Regulatory strategy use is a specific behavior which fits into the wider construct of self-regulated learning which has great bearing on students' academic achievement. Zimmerman (2012) proposes that self-regulated learning refers to how students become masters of their own learning processes. Zimmerman does not see self-regulation as a mental ability or a performance skill but rather is the self-directed process through which abilities are transformed into task-related skills. Boekaerts, Zeidner, and Pintrich (2000) state that "self-regulation involves *cognitive*, *affective*, *motivational,* and *behavioral* components that provide the individual with the capacity to adjust his or her actions and goals to achieve the desired results in light of changing environmental conditions" (p.751).

Bembenutty (2006) points out that when conflicts arise for students between pursuing important academic goals and yielding to tempting distractions, the self-regulated learner is able to remain task-focused despite their immediate impulses and they are able to delay gratification and students who are not as skilled at self-regulated learning are unable to delay gratification. This connects to the construct of time perspective, suggesting that students with a *future* time perspective are more self-regulated in their learning. Bembenutty believes that "the differences between different types of learners may be explained by their unique characteristics such as personal goals, vicarious experiences, history of reinforcement, social modeling, and highly influential environmental and social conditions" (p. 1). Bembenutty's statement supports the placing of achievement goals as a proximal antecedent of *regulatory strategy use* in the conceptual framework of this study.

The term 'self-regulated learning' can be used in both a wide and in a narrow sense. Zimmerman points out that in the wide sense, a student is self-regulating his learning if he is able to choose what, when and where to learn. However, most of the time the term is applied to "specific situations where students have been given a learning task and it is now up to them to self-regulate the learning processes involved in doing the task, this would be called self-regulated learning in a narrow sense" (Zimmerman, 2012, p. 6). This research study examines self-regulation in a narrow sense. It focuses on the construct specifically in relation to students' use of digital technology in their learning. In the conceptual framework of this study, students' time perspective and achievement goal orientations are predictors of *regulatory strategy use.*

This study focuses on *regulatory strategy use* specifically related to students' use of digital technology in their learning. The focus is on *effort regulation* strategies that students use when using digital technology in their learning. This demonstrates itself though students' ability to use digital technology in a controlled manner without being distracted by other online and non-study related activities.

 ISSN 2094-1420

This study measures these variables using the items that relate to the *control* subscale on Marshall's (2012) Tech-savvy Scale and an adapted version of the *effort-regulation* subscale of Pintrich et al.'s (1993) MSLQ which places effort regulation in the context of students' digital technology use.

Literature Review

Previous research has examined relations between time perspective *regulatory strategy use*. A study by Ward, Guthrie and Butler (2009) found that *future* time perspective was related to higher levels of education and socio-economic status. Leondari (2007) also found positive relations between *future* time perspective and academic achievement. Barber et al. (2009) studied relations between self-control, time perspective and academic achievement. They concluded that self-control moderated the relationship between time perspective and academic achievement and they found that College students with *present-hedonistic* time perspective had *lower* GPAs and those with *future* time perspective.

Time perspective has also found to be a predictive antecedent of achievement goal orientations. Campen (2010) carried out a study of relations between time perspective and achievement goal orientation and found significant positive correlations between *performance-approach* and *mastery-approach* achievement goals and *future* time perspective. Bembenutty and Karabenick (2004) also found associations between academic delay of gratification, *future* time perspective, and self-regulated learning.

Lee et al. (2010) investigated time perspective and achievement goal orientation using structural equation modeling (SEM) and they found that *future* time perspective positively predicted *mastery-approach* achievement goal orientation. They found that students who have *future* time perspective are more likely to exert effort into mastering the academic tasks required of them, and are less likely to be distracted by the use of digital technology in their learning. On the other hand, *present-hedonistic* students are less likely to adopt approach goals and be regulated in their use of digital technology in their learning.

Students who adopt *performance* and *mastery-approach* achievement goals are more likely to engage in deep learning strategies as their achievement goal orientation leads them to be more engaged in their learning (Chiang et al., 2011; Lau et al. 2008; Liem et al. 2007). This study examines how achievement goals predict *regulatory strategy use* which is vital for academic achievement in technology-rich constructivist learning environments.

It is important to consider the impact of cultural differences on achievement goals. Research with predominantly western participants has identified *mastery-approach* goals as the most adaptive and *performance-approach* goals as less adaptive antecedents of adaptive learning behaviors (Wolters, 2004). However, research within the Asian context has shown that *performance-approach* goals also positivity predict student adaptive learning strategies (Lau et al., 2008). This study has a culturally diverse sample of high school student in an international school in

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the Philippines. This will give us further insight into how time perspective and achievement goals relate and regulatory strategy use in a multi-cultural and technology-rich learning environment.

In the conceptual framework of this study achievement goals are placed as proximal antecedents of regulatory strategy use. Previous research on relations between achievement goals and *regulatory strategy use* has highlighted the adaptive nature of *mastery-approach* achievement goals. Lau et al. (2008) found that *mastery-approach* goals positively predicted classroom attentiveness and deep learning. Unlike research carried out on western samples, Lau et al. also found *performance-approach* achievement goals to be adaptive in their sample of Singaporean secondary school students. *Performance-approach* achievement goals positively predicted group participation and deep learning in their study.

Grant and Dweck (2003) studied relations between achievement goals and *regulatory strategy use* in a sample of university students from the USA. They found that *mastery-approach* goals predicted active coping, sustained motivation, and higher achievement in the face of challenge. On the other hand, *performance-approach* goals were not adaptive and predicted withdrawal and poorer performance in the face of challenge. Furthermore, Grant and Dweck's (2003) analysis suggested that the relationship between achievement goals and course grades was mediated by the tendency to engage in deeper processing of course material. This offers justification for the placing of a narrow domain specific measure of *regulatory strategy use* as an antecedent of achievement goals within the conceptual framework of this study.

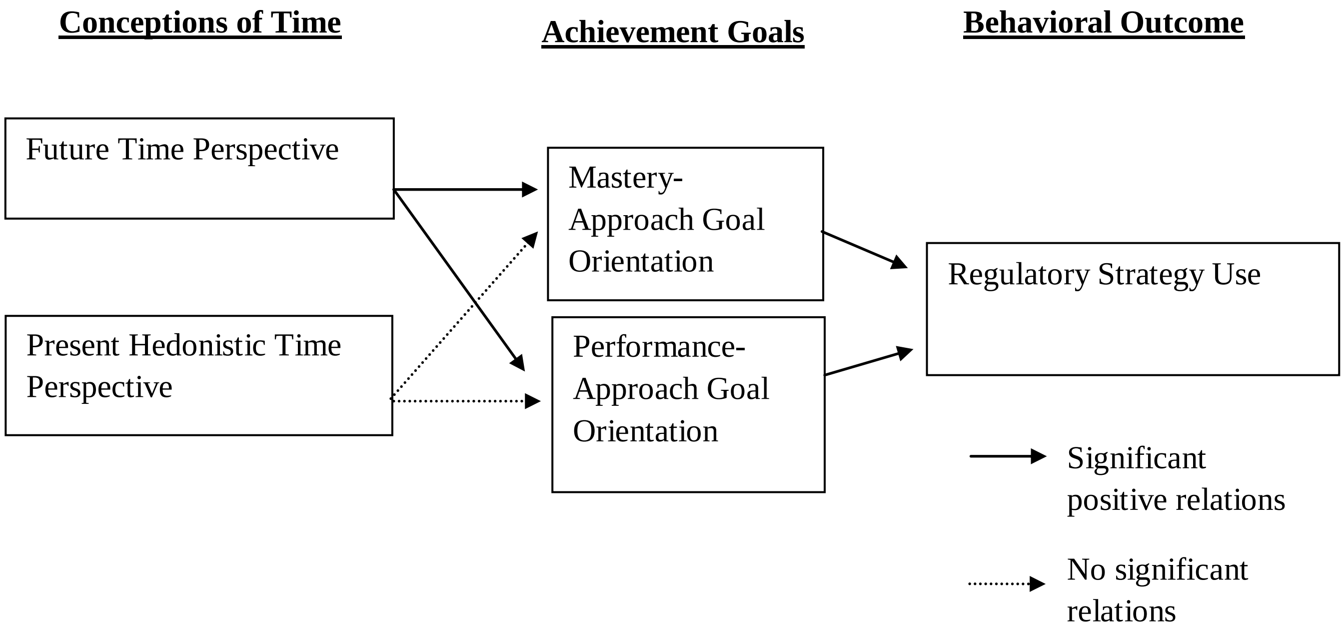
In summary, today's students are operating in technology-rich environments where the ability to be regulated and controlled users of digital technology has been shown to relate to academic achievement (Marshall, 2012).*Future* time perspective is an antecedent *mastery-approach* and *performance-approach* achievement goals and these achievement goals are an antecedent of *regulatory strategy use* (Grant & Dweck, 2003; Campen, 2010). This means that achievement goal orientations *mediate* relations between time perspective and regulatory strategy use. According to Baron and Kenny (1986) mediators are variables that account for relations between the predictor and the outcome variables. The conceptual framework of this study integrates these constructs into a unified model.

Research Questions

1. Do time perspectives *predict* achievement goals?
2. Do achievement goals *mediate* relations between time perspective and regulatory strategy use?
3. Do achievement goals *predict* regulatory strategy use?

 ISSN 2094-1420

Figure 1
Conceptual Model of Conception of Time, Achievement Goal, and Behavioral Outcome



Method

Participants

The participants were an opportunity sample of 460 high school students of with 259 females and 201 males from an international school in Metro Manila, Philippines. Participants were from varied cultural and ethnic backgrounds. All students came from high socio-economic status, all of the students use digital technology in their learning and the school had a high level of digital technology resources. The schools mission statement and curriculum is focused on the use of constructivist teaching and learning.

Instruments

Time Perspective. This was measured using the Zimbardo Time Perspective Inventory (ZTPI) subscales for *present hedonistic* and *future* time perspective (Zimbardo& Boyd, 1999). The *Present-hedonistic time perspective* subscale measures the extent to which a person adopt reflects a hedonistic, risk-taking, devil may care attitude towards time and life (α=.79). The *future time perspective* subscale measure the extent to which a person reflects behavior that is dominated by striving for future goals and rewards (α=.77) (Appendix A& B). It was a four-point forced choice Likert type scale and students read the statements and click their answers to corresponding statements ranging from 'Strongly agree' (4) to 'Strongly disagree' (1).

 ISSN 2094-1420

Achievement goals. In this studytwo sub-scales of students' achievement goals were measured with an adapted version of the Patterns of Adaptive LearningSurvey (PALS) (Midgley et al., 2000; Lau et al., 2008) (Appendix A& B).The *mastery-approach*(α=.80) goal sub-scale measured the extent to which students focusedon learning new, challenging and interesting things in their learning. The *performance-approach*(α=.86)goal sub-scale measured the extent to which students focuson demonstrating that they are more capable than others in their learning.Students clicked their answers on a Likert type scale from 'Strongly agree' (4) to 'Strongly disagree' (1).

Regulatory strategy use. The *control* sub-scale of Marshall's (2012) Tech-savvy Scale was used (Appendix A) along with an adapted version of Pintrich et al.'s (1993) MSLQ sub-scale items on *effort regulation* were used to measure *regulatory strategy use* (α=.74). This sub-scale measured how controlled students are in their use of digital technology in their learning (Appendix A& B). It was a four-point forced choice Likert type scale andstudents read the statements and click their answers to corresponding statements ranging from 'Strongly agree' (4) to 'Strongly disagree' (1).

Procedure

Data was gathered in high school classes fromduring student's homeroom periods. The high school administration was contacted by the researcher to ask if they were willing to allow students to take part in the study. After permission was obtained the researcher then created an online version of the scales outlined above using Google Docs called the *Student Learning Research Survey* (Appendix A). A message was sent out to by the high school administration to all homeroom teachers to administer the *Student Learning Research Survey* to studentsduring homeroom period (2.30pm-3pm) as a whole class. Students were informed by their homeroom teacher that the scale was examining their beliefs, motivationsand use of digital technology in learning. Students were informed that that all their answers were confidential in order to adhere to the ethical guidelines for research set out by the American Psychological Association (APA, 2002). Homeroom teachers then instructed students log into their laptops and retrieve the link to the Student Learning Research Survey from their school email inbox and read the instructions at the top of the *Student Learning Research Survey.* Students then filled out the items by clicking in the assigned boxes (Appendix A). This was carried out in silence. After 10 minutes homeroom teachersthanked students for taking part in the research study. After the data was collected apath analysis was carried out using PASW and AMOS data analysis software.

Results

A path analysis using structural equation modeling (SEM) was used to examine predictive causal relations between the variables in the using regression equations (Byrne, 1998). Table 1 shows the descriptive statistics, Table 2 is a summary of the regression equations between the variables in the model and Figure 1 is the path diagram of the model.

Table 1.
Descriptive Statistics for all variables in the model

	Present Hedonistic TP	Future TP	Mastery Approach GO	Performance Approach GO	Regulatory Strategy Use
Mean	2.85	2.9	3.50	2.68	2.74
SD	.41	.49	.46	.72	.55

Table 2
Regression equations for relations between time perspective goal orientations and regulatory strategy use.

Path	Regression Equation	Standard Error	*p*-value
Present Hedonistic TP → Mastery Approach GO	0.125	0.048	0.009
Present Hedonistic TP → Performance Approach GO	0.117	0.079	0.139
Future TP → Mastery Approach GO	0.416	0.041	0.001*
Future TP → Performance Approach GO	0.397	0.067	0.001*
Mastery Approach GO → Regulatory Strategy Use	0.326	0.051	0.001*
Performance Approach GO →Regulatory Strategy Use	0.142	0.033	0.001*

*$p<0.05$

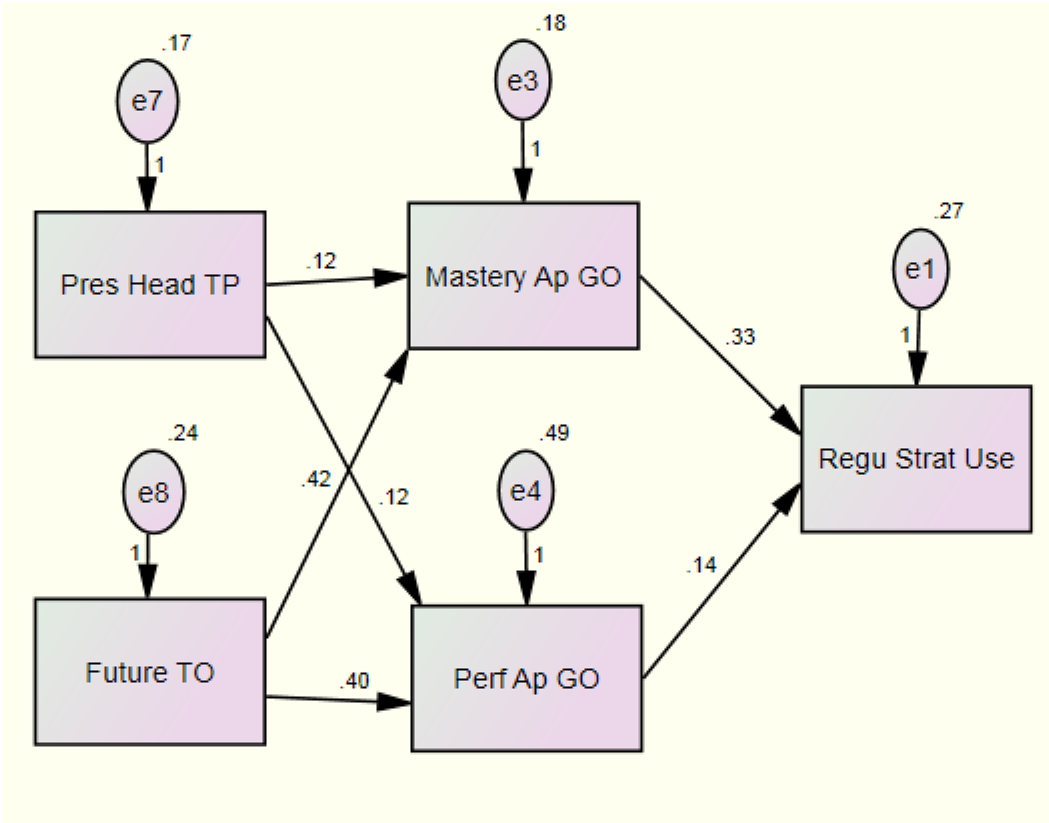


Figure 2.
Path diagram of predictive relations between time perspective, goal orientations, and regulatory strategy use.

Three measures of goodness of fit were used, the Goodness of Fit Index (*GFI*) which accounts for the relative amount of variance in the model.The Comparative Fit Index (*CFI*) compares fit to an independent model. TheStandardized Root Mean Square Residual (SRMR) is an absolute measure of fit and is defined as the standardized difference between the observed correlation and the predicted correlation. The reason why the commonly used *RMSEA* model fit indices was not used was because of the low *degrees of freedom* of the model (df=4). Kenny, Kaniskan, and McCoach (2011) argue to not even compute the RMSEA for low *df* models.

For *GFI* and *CFI* values greater than .09 indicate good fit (Shaufeli et al., 2002). For SRMRa value less than .08 is generally considered a good fit (Hu &Bentler, 1999).The model had good fit, with a *GFI* .909 and a *CFI* of .59 and a SRMR of .029 (df=4).

Future time perspective positively predicted *mastery-approach* and *performance-approach* achievement goals (p<0.05). *Present-hedonistic* time perspective did not predict *mastery-approach* and *performance-approach* achievement goals (p>0.05). *Mastery-approach* and *performance-approach* achievement goal orientation positively predicted *regulatory strategy use* (p<0.05).

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Goal orientations *mediate* relations between *future* time perspective and *regulatory strategy use* ($p<0.05$).

Discussion

The path analysis model has good fit and conforms to the conceptual framework of this study. The model shows that approach achievement goals mediate relations between future time perspective and regulatory strategy use in the technology rich-learning constructivist learning environment. This model addresses a gap in the literature through explaining the predictive relationship between time perspective and approach goal orientations, unifying Zimbardo and Boyd's (1999) time perspective with Elliot and McGregor (2001) achievement goal orientations. The model shows that both *mastery-approach* and *performance-approach* goal orientation positively predict *regulatory strategy use.* Furthermore, the model shows that *future* time perspective positively predicts *performance-approach* and *mastery-approach goal* orientation. In the context of Bandura's (1986) social cognitive theory the model shows that a student's conception of time influences their achievement goal orientation which in turn influences their regulatory strategy use.

Some students with *future* time perspective have a strong drive and need for personal achievement and thus pursue *mastery-approach* goals. These students see how important it is to study and appreciate the long term benefits of studying, so they are motivated to do well in relation to their own personal standards, and they are less likely to be distracted because they use regulatory strategies when learning. The student who pursues *mastery-approach* goals is the most controlled and self-regulated in their use of digital technology. This is because they are focused on the task, so they are able to avoid the distractions that digital technology offers.

Some students have *future* time perspective but adopt *performance-approach* goals and these students judge their performance in comparison to others and are competitive. In the technology-rich environment they also employ regulatory strategies, but not as effectively as the students who have *mastery-approach* goal orientation. The *performance-approach* goal oriented student is concerned by their own performance in relation to others and the technology rich-environment allows them to easy connect and also be distracted by other students who they are trying to outperform.

In the model, *performance-approach* and *mastery-approach* goal orientations both predict *regulatory strategy use* but there is a higher regression coefficient for *mastery-approach* (0.33) than for *performance-approach* (0.14). This finding confirms those of Lau et al. (2008) and Liem et al. (2007) in the technology-rich learning environment with a more multi-cultural sample. The results of this study also support those of Chiang et al.'s (2011) and Liem et al. (2007) who found that in the Singaporean and Taiwanese context both *mastery-approach* and *performance-approach* goals were related to adaptive behavioral outcomes.

 ISSN 2094-1420

Students who have a *present-hedonistic* time perspective do not pursue approach goals. These students are focused on the 'instant gratification' in present and because of this they are not *performance-approach* or *mastery-approach* goal oriented and do not employ effective regulatory strategies when using digital technology. Digital technology is a distraction for students who have a *present-hedonistic* time perspective as it enables them to engage socially with others and do other non-academic tasks like gaming rather than focusing on the learning the class materials.

The model shows that *mastery-approach* goal orientation clearly *mediates* relations between future time orientation and achievement goals in technology-rich learning environments, and it shows that *present hedonistic* time orientation and to a lesser extent *performance-approach* goal orientations are not as adaptive in the technology- rich learning environment. This has implications for the teaching in the constructivist, technology-rich learning environment because it suggests that this learning environment best suits students who have a *future* time perspective and *mastery-approach* goal orientation. Teachers should encourage students to adopt a *future* time perspective and pursue *mastery-approach* goals. They can do this through developing a mastery goal structure climate in their classrooms, and this will encourage students to be controlled and self-regulated in their use of digital technology.

The results of this study enhance our understanding of students learning in technology-rich environments because it gives a clearer picture of how students' conceptions of time, motivations and learning behaviors in this context. However, it is important to recognize the methodological limitations of this quantitative cross-sectional study. Further studies are needed to gain a deeper understanding of the relations between the variables. When a clearer picture emerges of relations between these between variables, experimental research can allow us to examine the effectiveness of interventions to improve student learning in technology-rich environments.

In conclusion, this study found that *future* time perspective predicts both *performance* and *mastery* approach goal orientations, and that high school student's *mastery-approach* and *performance-approach* goal orientation *mediated* relations between future time perspective and *regulatory strategy use* in the technology-rich constructivist learning environment.

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Appendix A

Student Learning Research Survey

The following items relate to your learning.

The data will be used for research on student learning.

For the questions related to your classes answer these in relation to classes which you do use a laptop/PC.

All responses are confidential.

Please read each item carefully and click in the circle that relates to you.

*Required
1. Select your gender. *

- ○ Male
- ○ Female

2. Select your grade. *

- ○ Grade 9
- ○ Grade 10
- ○ Grade 11
- ○ Grade 12

3. Do you use a laptop/PC when studying? *

- ○ Yes
- ○ No

4. It's important to me that I learn a lot of new concepts this year. *
5. I meet my obligations to friends and authorities on time. *
6. It's important to me that I thoroughly understand my class work. *
7. I make lists of things to do. *
8. I am able to resist temptations to when I know that there is work to be done. *
9. I rarely feel lazy or bored when I study using my PC/laptop. *
10. One of my goals is to show others that I'm good at my class work. *

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11. Even when course materials are dull and uninteresting, using my PC/laptop helps me to keep working until I finish. *
12. I use my laptop/PC to help me stay organized and monitor my learning. *
13. I take each day as it is rather than try to plan it out. *
14. One of my goals is to show others that class work is easy for me. *
15. It's important to me that I improve my skills this year. *
16. If things don't get done on time, I don't worry about it. *
17. I believe that a person's day should be planned ahead each morning. *
18. It's important to me that I look smart compared to others in my class. *
19. One of my goals in all my classes is to learn as much as I can. *
20. I conduct myself in an ethical and responsible manner when using laptop/PC in my learning. *
21. One of my goals is to look smart in comparison to the other students in my class. *
22. I find myself getting swept up in the excitement of the moment. *
23. One of my goals is to master a lot of new skills this year. *
24. I keep working at difficult, uninteresting tasks if they will help me get ahead. *
25. It's important to me that other students in my class think I am good at my class work. *
26. I do things impulsively. *
27. I am able to use my PC/laptop in my learning without being distracted. *
28. It upsets me to be late for appointments. *
29. It is more important for me to enjoy life's journey than to focus only on the destination. *
30. I think carefully about the most efficient way to use my laptop/PC before engaging in a learning task. *
31. I complete projects on time by making steady progress. *
32. It is important to put excitement in my life. *
33. There will always be time to catch up on my work. *
34. Taking risks keeps my life from becoming boring. *
35. I feel that it's more important to enjoy what you're doing than to get work done on time. *

Appendix B

Scales to for time orientation, achievement goals and regulatory strategy use

Future Time Perspective (Adapted from Zimbardo and Boyd's 1999 ZTPI)

❑I meet my obligations to friends and authorities on time.

❑ I make lists of things to do.

❑ I am able to resist temptations to when I know that there is work to be done.

❑ I keep working at difficult, uninteresting tasks if they will help me get ahead.

❑ It upsets me to be late for appointments.

❑I complete projects on time by making steady progress.

Present Hedonistic Time Perspective (Adapted from Zimbardo and Boyd's 1999 ZTPI)

❑ I take each day as it is rather than try to plan it out.

❑ If things don't get done on time, I don't worry about it.

❑ I find myself getting swept up in the excitement of the moment.

❑I do things impulsively.

❑ It is more important for me to enjoy life's journey than to focus only on the destination.

❑It is important to put excitement in my life.

❑There will always be time to catch up on my work.

❑Taking risks keeps my life from becoming boring.

❑I feel that it's more important to enjoy what you're doing than to get work done on time.

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Mastery Goal Orientation (Adapted from Pintrich et al.'s 1993 MSLQ**)**

❑It's important to me that I learn a lot of new concepts this year.

❑One of my goals in all my classes is to learn as much as I can.

❑One of my goals is to master a lot of new skills this year.

❑It's important to me that I thoroughly understand my class work.

❑It's important to me that I improve my skills this year.

Performance-Approach Goal Orientation (Adapted from Pintrich et al.'s 1993 MSLQ)

❑It's important to me that other students in my class think I am good at my class work.

❑One of my goals is to show others that I'm good at my class work.

❑One of my goals is to show others that class work is easy for me.

❑One of my goals is to look smart in comparison to the other students in my class.

❑It's important to me that I look smart compared to others in my class.

Effort Regulation & Controlled use of digital technology (Adapted from Midgley et al. 2000 PALS & Marshall's 2012 Tech-savvy scale)

❑I rarely feel so lazy or bored when I study using my laptop/PC.

❑Even when course materials are dull and uninteresting, using my laptop/ PC helps me to keep working until I finish.

❑I think carefully about the most efficient way to use digital technology before engaging in a learning task.

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❑I conduct myself in an ethical and responsible manner when using digital technology in my learning.

❑I use my laptop/PC to help me stay organized and monitor my learning.

❑I use digital technology to help me stay organized and monitor my learning.

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