Effect of Academic Goal Orientation, Goal Setting, and Planning on Academic Achievement of Secondary Students in Hong Kong

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1. Introduction

Prior research conducted in the West provided strong empirical support for the predictive power of self-regulated learning on academic achievement in a wide range of content domains (e.g. Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Phan, 2009; Pintrich, 2000a; Zimmerman, 2008a, 2008b). Despite the importance of self-regulated learning in student achievement, relatively few recent studies have examined the relationship between self-regulated learning and achievement in classroom settings (Day, 2011). Even fewer studies have explored the relationship among academic goal orientation, goal setting, planning, and achievement of Hong Kong secondary students. In Hong Kong, school education is characterized by Confucian learning tradition, and strong parental and societal emphasis on academic achievement (Lee, Yin, & Zhang, 2009; Law, Chan, & Sachs, 2008). Classrooms in Hong Kong are often described as student-centred, with obedience to teachers as the norm, and group (rather than individual) achievement goal orientation (Kan, 2010). The extent to which research findings on the effect of self-regulated learning on academic achievement from western cultures can be generalized to learners in Hong Kong remains unclear. This study aims to fill this gap in the literature.

Although several different perspectives on self-regulated learning have been proposed in the literature, they all emphasize the conscious and deliberate effort made by students in their pursuit to achieve the intended goal. There is also a contemporary consensus in the literature (Schunk, Pintrich & Meece, 2008) regarding the cyclical nature of the "self-oriented feedback loop" involving planning, goal setting, engagement, resources management, feedback, and self-regulation (Zimmerman, 2000).

Zimmerman (2000) theorized the cyclical model of self-regulated learning to comprise three sequential phases: forethought, performance, and self-reflection. Only the forethought phase is considered in this study. The forethought phase refers to processes that occur before the learning action, including planning and goal setting (Bandura, 2001; Kitsantas & Zimmerman, 2006). Learners' motivation for learning in terms of their goal orientation before starting on a piece of work is also crucial to subsequent learning (Boekaerts & Cascallar, 2006). This study analyses the variables of goal orientation (Kaplan & Maehr, 2007; Zimmerman & Kitsantas, 1997), goal setting (Gollwitzer & Oettingen, 2011; Zimmerman, 2008b), and planning (Gollwitzer, Fujita, & Oettingen, 2004; Gollwitzer & Oettingen, 2011; Oettingen & Gollwitzer, 2010) in the forethought phase of self-regulated learning.

1.1   Goal Orientation

Goal orientation (Kaplan & Maehr, 2007), or purpose goal, refers to the "why" of engagement in the pursuit of learning. Recent theories distinguish the concept more specifically and propose different models that involve various combinations of definitions and valence of goals (Elliot, Murayama, & Pekrun, 2011; Fishbach, & Ferguson, 2007). The literature reports that students may pursue multiple goals. That is, individual students can simultaneously endorse several goals, including future goals, societal goals, personal well-being goals, and mastery goals (Daniels, Haynes, Stupnisky, Perry, Newall, & Pekrun, 2008; Pintrich, 2000b; Luo, Paris, Hogan, & Luo, 2011; Mansfield, 2012; Tuominen-Soini, Salmela-Aro, & Niemivirta, 2012). In this study, secondary students' goal orientation was measured in terms of their perceived aims of education (e.g. 'I go to school because I want to enrich myself').

Ample research evidence from around the world reveals that academic goal orientation predicts secondary students' academic achievement. A Finnish study on students facing the transition from comprehensive school to upper secondary education showed that mastery- and success-oriented students were highly engaged in studying and found their schoolwork meaningful (Tuominen-Soini, 2012). In Spain, a study on the academic achievement of first-year secondary students showed that goal orientation directly predicted effort; in turn, effort and learning strategies directly predicted academic achievement (Perez, 2012). In Norway, a path analysis in a sample of 240 secondary school students showed that basic need support predicted mastery goals; then, both mastery goals and self-efficacy directly predicted achievement level, with self-efficacy being the stronger predictor (Diseth, 2012).

In Australia, a focus group interview study showed that students pursue multiple goals that are related to four main domains: future goals, achievement goals, social goals, and personal-best goals. Future goals played an important role in adolescents' motivation at school (Mansfield, 2012). Moreover, a multi-group multivariate path analyses showed that personal-best goals (specific, challenging, competitively self-referenced targets towards which students strive) are positively associated with academic outcomes for students in junior high school with (n = 87) and without (n = 3374) attention-deficit/hyperactivity disorder (Martin, 2012). Another study in a sample of 503 students aged 14–16 years from secondary school in two Austrian cities showed that social-oriented achievement motivation was indirectly correlated with academic achievement, mediated by performance-approach goals (Abd-El-Fattah, 2011).

Many of the studies on Hong Kong students' academic goal orientations have focused on the measurement of the construct (e.g. King, Ganotice Jr, & Watkins, 2012; Lau & Lee, 2008b; McInerney & Ali, 2006). These studies found that measurement scales that were internationally validated (e.g. the Inventory of School Motivation; McInerney & Ali, 2006) had strong validity for use with Hong Kong students. Four studies were found to focus on substantive issues related to goal orientation among Hong Kong students. These include the longitudinal study by Salili and Lai (2003) who found, *inter alia*, that Hong

Kong students from schools with low average student abilities were more inclined towards surface learning goals and had lower attainment scores than students from schools with high average student abilities. Nevertheless, irrespective of school type, Salili and Lai (2003)—over the course of their three-year study—found Hong Kong secondary students to be more inclined towards performance goals than other learning goals.

The findings of Salili and Lai (2003) were not completely replicated by other studies on Hong Kong students. For example, Lee, Tinsley, and Bobko (2003) found a strong correlation (r = 0.71) between learning and performance goal orientations among Hong Kong students, which indicated a lack of distinction between the two goal orientations among the students. Further, Yeung and McInerney (2005) also found Hong Kong secondary students to be more task and effort orientated, both aspects pertaining to the dimension of mastery orientation, than performance orientated. Lau and Lee (2008a) showed that while mastery goals were the strongest predictors of strategy use for Hong Kong students, mastery goals and strategy use were positively correlated with performance-approach goals and perceived instrumentality. Lau and Lee (2008a) concluded that mastery and performance goal orientations do not contradict one another. Rather, students pursuing both types of goals were more adaptive in learning as compared to students with single goals (Lau and Lee, 2008a). These findings were in line with the large-scale review by Linnerbrink-Garcia, Tyson, and Patall (2008) involving over 90 studies; they found both mastery and performance-approach goal orientations to be beneficial for academic achievement.

1.2   Goal Setting

Goal setting refers to the process of establishing a specific target or outcome or determining "what" the learner aims to achieve (Schunk, 1989; Zimmerman, 2008b). Goals that are set appropriately can serve as guides for students' learning effort, motivate high effort, and sustain students' persistence in the face of challenges (Zimmerman, 2008b). On the basis of extensive review of research on goal setting (Locke & Latham, 2002) and social cognitive

theories (Bandura, 1986), Zimmerman (2008b) identified eight criteria of appropriately set goals. These criteria are goal specificity, proximity, hierarchy of organisation, alignment between goals set by an individual and significant others, level of goal difficulty, degree of autonomy and level of conscious awareness in goal setting, and whether goal orientation is process or performance orientated. In this study, goal setting was measured in terms of the extent students set specific targets for their own study.

As a key process of self-regulation, goal setting has been found to be helpful in improving students' academic achievement (Fleming, 2002; Peters, 2012). In a recent study, Zimmerman (2008b) described how a teacher helped an at-risk student to set and implement self-regulatory learning goals and subsequently led to improvement of the student's academic achievement. Other studies in the literature also provided empirical evidence on the positive effect of goal setting on the enhancement of students' achievement in academic and non-academic subjects at school and university levels in the UK (Lee, 2003), Greece (Kolovelonis, 2012), the Netherlands (Andriessen, 2006), and the USA (Moeller, Theiler, & Wu, 2011).

In an experiment by Kolovelonis (2012), 85 fifth- and sixth-grade Greek students with no experience in dart throwing were randomly assigned to one control and four experimental groups. It was found that the combined use of goal setting and self-talk had a significant positive impact on students' dart-throwing performance in physical education. In the same vein, Andriessen's (2006) study involving both minority (n = 279) and native (n = 229) students in Dutch secondary schools found that students who valued distant future goals, particularly self-set future goals, and those who perceived positive connections between present school tasks and future goals developed an increased interest in their schoolwork; this, in turn, motivated effective classroom learning.

A five-year quasi-experimental study in a sample of 1,273 students from 23 high schools in America also revealed a statistically significant relationship between the goal-setting process and second-language performance in the Spanish language classroom (Moeller, Theiler, & Wu, 2011).

Research into goal setting among Hong Kong students is rare and largely involved university students rather than secondary or primary students. Of note are the series of studies by Kember and associates of undergraduate students (e.g. Kember, Hong, Ho, Ho, 2011). We are not aware of systematic studies on the effect of goal setting on academic achievement of Hong Kong secondary students.

1.3 Planning

In the theoretical context of self-regulated learning, planning refers to the anticipated behaviour and processes employed by the learner in responding to a situational cue related to a future goal (Gollwitzer & Oettingen, 2011; Pintrich, 2000). Planning is concerned with the 'how' in the implementation of intended goal-directed behaviour. Planning strategies often involve an 'if-then' structure. For example, 'If there is such and such obstacle in pursuing this goal, then I will do such and such', or 'If there is such and such obstacle in pursuing this goal, then I will do this and that' (Gollwitzer & Oettingen, 2011; Pintrich, 2000). Such 'if-then' plans were found to facilitate the attainment of goals (Gollwitzer, Fujita, & Oettingen, 2004). In this study, planning is measured in terms of intended strategies and behaviour processes used by students to achieve their goals.

A meta-analysis of 94 studies by Gollwitzer and Sheeran (2006) highlighted that merely making a commitment to attain a goal did not necessarily prepare people for dealing effectively with self-regulatory problems in goal striving. However, goal striving could benefit from plans that specify the when, where, and how of goal striving in advance, which in turn had a medium-to-large positive effect on goal attainment. Planning provides significant benefits to the completion of goals (Aarts, 1999). It functions as a bridge to close the gap between the establishment of a goal and its realization (Gollwitzer & Oettingen, 2011). Planning controls for unwanted influences on goal attainment and then facilitates goal commitment and goal striving (Oettingen, Mayer, Thorpe, Janetzke, & Lorenz, 2005).

In the context of secondary schools, the benefit of planning in academic achievement was examined by Cohen (1995) in a study of 60 elementary students. The study found that teacher ratings of students' academic planning predicted students' grades in reading, language arts, written language, and mathematics. Another study by Eilam (2003) found that high-achieving Israeli students in the ninth grade generally exhibited more self-regulation learning skills including the ability to set goals, plan activities, readjust plans to improve progress rates, and other self-regulation learning skill techniques than did average-achieving students. To the best of our knowledge, no studies have been conducted on the relationship between academic planning and achievement among Hong Kong students.

1.4 Research Question and Hypotheses

Based on the reviewed literature on prior research conducted in Hong Kong and elsewhere, it was hypothesized that academic goal orientation (the 'why' of learning), goal setting (the 'what' of learning), and planning (the 'how' of learning) had a positive effect on academic achievement. Figure 1 presents the hypothesized model that is evaluated in this study.
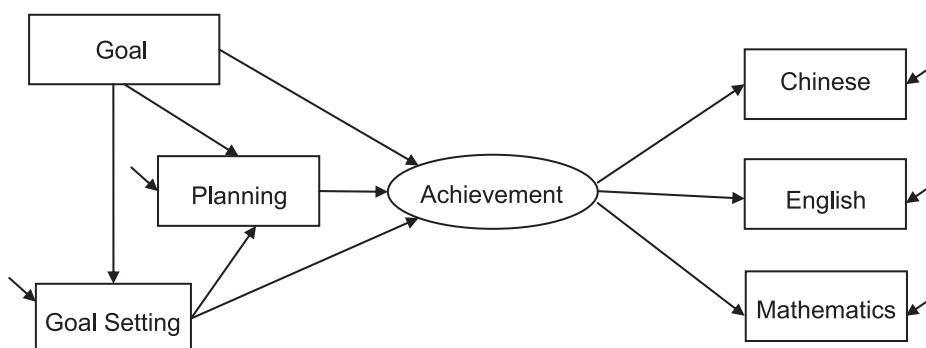

Figure 1. Hypothesized model

2.   Method

The present study was part of a larger study funded by a Competitive Earmarked Research Grant (HKIED 8005/03H) of the Research Grants Committee, Hong Kong SAR Government, which aimed to establish a conceptual framework of self-directed learning among secondary students in Hong Kong. The present study was focused on developing structural relations among academic achievement and academic goal orientation, goal setting, and planning of secondary students. A cross-sectional survey research approach was used.

2.1 Instruments

The data collection instruments included a self-reported questionnaire and academic achievement tests for the subjects of Chinese language, English language, and Mathematics. The questionnaire comprised five items to be scored on a four-point Likert-type scale with the following response categories: Strongly Disagree, Partly Disagree, Partly Agree, and Strongly Agree. The scales were designed to measure academic goal orientation (e.g. 'I go to school because I want to enrich myself'), goal setting (e.g. 'I set learning goals which I think are likely to be achievable'), planning (e.g. 'At the beginning of each school term, I set a learning plan for myself'), and other aspects of self-regulated learning that were not included in this study. The scales had strong validity, reliability, and unidimensionality. Cronbach's alpha for academic goal orientation, academic goal setting, and academic planning scales ranged from 0.79 to 0.82 (Mok, Cheng, Moore, & Kennedy, 2006).

Academic achievement was measured by students' results at the within-school end-of-term examination in Chinese, English, and Mathematics. The examination scores were double standardized within and across all schools to control for differences in examinations used by other schools in the sample.

2.2 Procedures

All participants completed anonymous questionnaires in school during one class session. The questionnaires were then scanned and the data captured electronically. Over 99.9% of all responses were valid.

The latent variables were students' trait of academic goal orientation, goal setting, and planning. Respondents and questionnaire items were calibrated on the same measurement scale using a Rasch rating scale model (Bond & Fox, 2007) using Winsteps® (version 3.72.3) (Linacre, 2012). The calibrated Rasch measures were used for subsequent Structural Equation Modelling using Mplus (version 6) (Muthén & Muthén, 1998–2010) in order to test the hypothesized relationships between the students' self-regulated learning variables and their academic achievement.

It should be noted that the students who were sampled were nested within classes, and classes within school, which implies that multilevel modelling (Goldstein, 2011) should be used to analyse the data. However, the double standardization processes used to adjust for differences in test papers used across schools concealed the real structure of the data. Furthermore, analysis using MLwiN (Version 2.12) (Rasbash, Steele, Browne, & Goldstein, 2009) showed that intraclass correlations of all variables were very low (< 0.8% at the school level, and < 8% at the class level) (Table 1). Therefore, single-level analysis was used in this study.

Table 1. Variance and Intraclass Correlations across Year Levels

Variables	School-level variance (SE)	Class-level variance (SE)	Total variance (SE)	School-level intraclass correlation	Class-level intraclass correlation
Academic Goal Orientation	0.009 (0.012)	0.394 (0.0039)	5.170 (0.061)	0.002	0.071
Academic Goal Setting	0.010 (0.009)	0.222 (0.025)	4.639 (0.055)	0.002	0.046
Academic Planning	0.037 (0.016)	0.176 (0.023)	4.995 (0.059)	0.007	0.034

2.3   Data Source

Data for this study came from a larger study involving 14,846 secondary students currently enrolled at Secondary 1–4 (S1—median age 12 years; S4—median age 14 years) and at Secondary 6 (S6—median age 17 years) from 23 representative schools in Hong Kong. Secondary 5 and 7 students were not included because these students were in their public examination years.

The sample for this study comprised 13,741 students with complete data on the selected variables; 1,105 students were excluded because of missing data on one of the dependent or independent variables. Data on students' year level and gender were also collected. In the sample, there were 6,776 (49.3%) male students, 6,909 (50.3%) female students, and 56 (0.4%) students who did not indicate their gender. Table 2 presents the sample distribution by gender and year level.

Table 2. Sample Distribution by Gender and Year Level

	S1	S2	S3	S4	S6
Male	1943	1951	1157	1648	77
	(50.3%)	(49.6%)	(48.1%)	(48.1%)	(68.1%)
Female	1905	1969	1235	1764	36
	(49.3%)	(50.0%)	(51.4%)	(51.5%)	(31.9%)
Missing	13	15	13	15	0
	(0.3%)	(0.4%)	(0.5%)	(0.4%)	(0.0%)

Notes:

1. Within-year-level percentages are presented below the sample size and in parentheses.

2. S5 students were not sampled.

3. Results

3.1 Effect of Goal Orientation, Goal Setting, and Planning on Achievement

Results of Structural Equation Modelling (SEM) found that the hypothesized structural model fit the sample data well: CFI = 0.997, TLI = 0.994, RMSEA = 0.023 and SRMR = 0.009. The Chi-Square values for the baseline and final models were 16453.038 (d.f. = 15, n = 13,741, p < 0.000) and 56.106 (d.f. = 7, n = 13,741, p < 0.000), respectively. Although the Chi-Square value for the final model remained statistically significant, it was substantially lower than the baseline model; given the sensitivity of Chi-Square to sample size, the model-data discrepancies are acceptable (Byrne, 2012). Figure 2 depicts the final SEM.
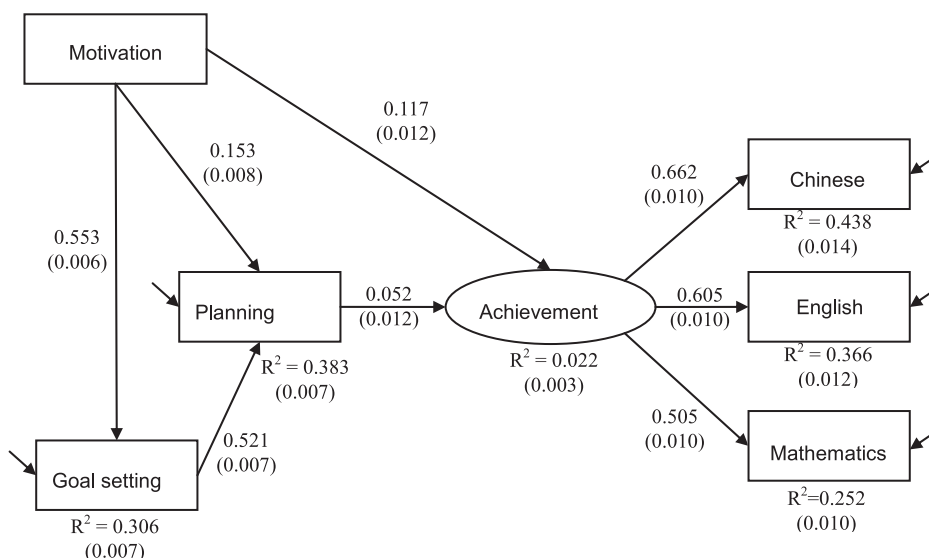

Figure 2. Final Structural Equation Model

Notes: All estimated parameters were standardized (STDXY) and all were statistically significant (p < 0.000).

Table 4 presents the estimates of the final SEM and shows that academic goal orientation (direct effect of 0.117) and academic planning (direct effect 0.052) both directly predicted academic achievement. Academic goal orientation was the stronger predictor, with a total effect value of 0.140. Academic goal setting indirectly predicted academic achievement (effect 0.027) through academic planning but there is no significant direct effect. Further, academic goal orientation predicted academic planning directly as well as through academic goal setting. Nevertheless, the explanatory power of the predictors on academic achievement is low (R^2 = 0.022).

Table 4. The Effects among Various Variables

	Estimate	S.E.
Ach on Goal Orientation (total effect):	0.140	0.011
Direct effect	0.117	0.012
Indirect effect via Plan	0.008	0.002
Indirect effect via Plan Via Goal Set	0.015	0.003
Ach on Plan (total effect = direct effect)	0.052	0.012
Ach on Goal Set (total effect = indirect effect)	0.027	0.006

Note: All estimated parameters are standardized (STDXY) and all the p values (two-tailed) of the estimates are 0.000. Goal Orientation = Academic Goal Orientation; Goal = Academic Goal Setting; Plan = Academic Planning; Ach = Academic Achievement; S.E. = Standard Error.

3.2   Effect of Gender and Year Level

Table 5 presents the model fit indices of the hypothesis structure by gender and year levels (S6 was excluded because of the sample size being less than 380) (Byrne, 2012). All commonly used fit statistics indicate that the models for male, female, and students in S1 to S4 fit the data well: CFI and TLI for all models were greater than 0.99; RMSEA for all models was less than 0.05 and SRMR for all models was less than 0.02.

Table 5. Model Fit Indices of Hypothesis Structure by Gender and Year Level

Index	Full	Male	Female	S1	S2	S3	S4
N	13741	6776	6909	3861	3935	2405	3427
χ^2	56.106	28.851	24.39	34.65	21.652	11.418	16.462
P	0.000	0.000	0.001	0.000	0.002	0.121	0.021
CFI	0.997	0.997	0.998	0.995	0.997	0.998	0.998
TLI	0.994	0.994	0.995	0.988	0.993	0.996	0.995
RMSEA	0.023	0.021	0.019	0.032	0.023	0.016	0.020
SRMR	0.009	0.011	0.01	0.013	0.011	0.011	0.010

Table 6 provides the path loadings and Table 7 the corresponding R-square values of the hypothesis structure by gender and year levels. The results show that the hypothesized structure is consistent across gender and year levels.

Table 6. Loadings of the Hypothesis Structure by Gender and Year Levels

Path	Full	Male	Female	S1	S2	S3	S4
Ach by Chi	0.662	0.634	0.644	0.625	0.654	0.645	0.731
Ach by Eng	0.605	0.586	0.571	0.658	0.619	0.623	0.518
Ach by Math	0.502	0.569	0.556	0.562	0.473	0.445	0.511
Ach on Plan	0.052	0.017#	0.040	0.078	0.036#	0.063	0.043#
Ach on Goal Orientation	0.117	0.129	0.108	0.127	0.143	0.115	0.067
Goal Set on Goal Orientation	0.553	0.557	0.546	0.588	0.539	0.530	0.506
Plan on Goal Set	0.521	0.512	0.535	0.500	0.515	0.509	0.550
Plan on Goal Orientation	0.153	0.159	0.138	0.175	0.173	0.132	0.115

Note: #Loading not significant at the 0.05 level. The other loadings are significant at the 0.05 level.

Table 7. R-Square of the Hypothesis Structure by Gender and Year Levels

Variables	Full	Male	Female	S1	S2	S3	S4
Goal Set	0.306	0.31	0.298	0.346	0.291	0.281	0.256
Plan	0.383	0.378	0.386	0.384	0.392	0.348	0.379
Chi	0.438	0.402	0.414	0.391	0.428	0.416	0.534
Eng	0.366	0.344	0.326	0.433	0.383	0.388	0.269
Math	0.252	0.323	0.309	0.315	0.223	0.198	0.262
Ach	0.022	0.019	0.017	0.031	0.026	0.023	0.009

Note: All the R-Square values in the table are statistically significant ($p < 0.05$).

4.   Conclusion and Directions for Future Research

Building on past research, this study hypothesized that metacognitive components of self-regulated learning predict achievement of secondary students in Hong Kong. This study extends existing knowledge by establishing a structural relationship between academic achievement and academic goal orientation, planning, and goal setting. SEM supported the hypothesized predictive effect of academic goal orientation, goal setting, and planning on academic achievement. Notably, the study found that the effect of academic goal orientation on academic achievement is stronger than either academic planning or goal setting. This is an important finding because within the framework of strong societal value on education, it is possible that Hong Kong students engaged in learning with academic planning or goal setting for external reasons such as fulfilling parental, teacher, or societal expectations rather than for the joy of learning itself. Nevertheless, this study found that if a student's academic goal orientation is aligned with mastery goals (e.g. studying for the love of learning), then this orientation is actually beneficial to achievement. Based on these findings, Hong Kong secondary teachers could pay more attention to helping students develop metacognition on their own academic goal orientations.

Further, this study also found that academic goal setting indirectly predicted academic achievement with its effect mediated through academic

planning. However, goal setting would have a substantial impact on achievement only when students have a relatively high score in planning; thus, it is suggested that teachers develop their students' competencies in academic planning.

This study showed that all effects of academic goal setting on academic achievement are positive, and consistency was found both in the structure and effects of the predictors across gender and year levels. This is important information in terms of guiding intervention development.

One limitation of this study is the use of cross-sectional surveys. Future studies must be conducted using longitudinal control experiments to examine the effect of academic goal orientation, goal setting, and planning on students' academic achievement.

Acknowledgements

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