Teaching for Course Interest

ACCEPTED VERSION

Abstract

Motivations-beliefs for learning and their relationship to instructional experiences are a poorly understood aspect of higher education. Notably, interest is an individual difference that both researchers and educators alike believe should be supported. However, this support is too often relegated to the craft of instruction. To be enhanced broadly, interest must be considered from a scientific perspective. In this study the longitudinal connections between students' domain/course-level interest, the instruction students' experienced, students' exam scores and attendance were assessed. First-year university students in Japan (n=1000,Female=271) participated in the study. Students completed surveys at three time points across one semester of study. Students' initial domain interest presented medium-to-large βs with instructional experiences, future course interest, and exam scores, and positive instructional experiences (autonomy-supportive and structuring). Future course interest presented medium-β for course attendance. Small relationships were observed between students' sex and their instructional experiences. Theoretical and practical implications are discussed.

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1 Introduction

When we consider the teachers in our past who have meaningfully impacted our lives, they are typically the ones who sparked and helped sustain our interest in a topic, person, or idea. In many cases, such exemplary teachers helped us develop the confidence we needed to take a risk or persist in the face of difficulties. To this end, the types of support they provided in our education likely included the strengthening of our motivations and emotions (i.e. autonomy-support), and the instilling/reinforcing of confidence in our ability to succeed (i.e. structure). Teachers who design their pedagogy around meaningful support in this manner are more likely to help students develop a range of internal resources that remain viable long after subject-specific knowledge has faded.

Considerable research has examined autonomy-support, structure, and external control as a meta-theory of instruction supporting engagement. This research, in its constituent components, was undertaken by early theorists of perceived control theory (Belmont, Skinner, Wellborn, & Connell, 1988; Skinner, Chapman, & Baltes, 1988) and self-determination theory (Deci & Ryan, 1987; Grolnick & Ryan, 1989; Ryan & Grolnick, 1986), and was later integrated into a cohesive empirical model describing the interaction between instructional experiences and student engagement (e.g., Skinner & Belmont, 1993). Longitudinal studies have since indicated a broad range of important implications regarding various elements of instruction such as motivation (Fryer & Oga-Baldwin, 2019a), engagement (Skinner, Furrer, Marchand, & Kindermann, 2008), and

achievement (Jang, Kim, & Reeve, 2012). Longstanding studies (Skinner & Belmont, 1993) and more recent ones (Fryer & Oga-Baldwin, 2019) have established reciprocal relationships that connect students' instructional experiences with their motivations and ability-beliefs.

The current study aimed to extend our understanding of the connections highlighted to this point. Specifically, this study aimed to establish linkages between instructional experiences, students' desire to re-engage with learning materials (i.e., their interest in a domain and a course of study) and critical, observed outcomes within higher education (course achievement and course attendance).

1.1 Essential Latent Components of Instructional Experiences

Different models have been employed in investigations of students' instructional experiences. From classroom structures in middle-secondary school (e.g., Fryer & Oga-Baldwin, 2019; Jang et al., 2012; Jang, Reeve & Deci, 2010) to broad learning environments in higher education (e.g., Ayllón, et al., 2019; Leenknecht, et al., 2017), researchers have been interested in understanding how student experience supports–or fails to support–the determinants of student learning. One area that has received considerable attention with regard to the support and harm of students' internal resources for learning is engagement. The relationship between instructional experiences and students' motivations-beliefs has been addressed through models such as flow (Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2014), achievement goals (Ames, 1992), perceived control (Skinner et al., 1988), and the regulation of motivation (Deci & Ryan, 1987). The integration of the latter two models for addressing instructional experiences and motivations-beliefs has undergone consistent development over the past four

decades. This development has been chiefly undertaken by self-determination theorists who drew on initial longitudinal modelling by perceived control researchers (e.g., Skinner & Belmont, 1993) in order to focus on the implications for autonomy-support (Jang et al., 2012; Jang, Reeve, & Halusic, 2016; Vansteenkiste, Simons, Lens, & Sheldon, 2004). This area of research has emphasized the importance of both structure and autonomy-support for student outcomes, and interventions have demonstrated the benefits to learning that result from the integration of autonomy-supportive instruction into the classroom (e.g., Jang et al., 2016).

Research on autonomy-support and structure has typically focused on the quality of motivation, while the ability-belief implications of instructional experiences have received comparatively less attention. Yet, motivation alone, regardless of its quality, paints an incomplete picture of the internal resources on which students rely to initiate and sustain learning. As modelled in one of the early studies in this area (Skinner, Wellborn, & Connell, 1990), the ability-beliefs of students (perceived control) also need to be taken into consideration. Students' ability-beliefs are what structure, as an instructional experience, was originally theorised to enhance (Skinner, 1995). In addition, a theoretical frame that integrates interest and its development with the quality of motivation as modelled by the self-determination theory (SDT) continuum (a broad model for understanding motivation as a product of psychological needs satisfaction) could more directly address students' developmental, domain, and course-specific reasons to persist in their learning.

Quantity of student motivation is not the central focus of this study. As with the majority of instructors in formal educational contexts, we are instead concerned with

getting students interested in their materials, their course, and (ideally) the wider domain of study. In light of this practical need, we feel it is important to directly address this source of motivation (i.e., interest).

1.2 Student Reasons and Their Perceived Reach

SDT is a broad meta-theory that connects psychological needs satisfaction (derived from the environment), with quality of motivation, and behaviour (Ryan & Deci, 2017; Deci & Ryan, 1985). In contrast, the construct of *interest* describes the reasons for engagement/re-engagement with a specific object or topic/domain (for a recent comprehensive discussion of this relationship see Renninger & Hidi, 2017). The four-phase model of interest (Hidi & Renninger, 2006; Renninger & Hidi, 2011) situates interest within a framework that provides an explanation for the developmental process through which students initiate and persist in learning. Unlike the motivation types defined in the SDT continuum, the four-phase model is developmental in its character. That is to say, *interest*, as presented by the model, is paired with the development of an individual's knowledge in a specific domain.

In addition to being domain specific, interest is a collative construct combining affective experiences (e.g., enjoyment; Ainley & Hidi, 2014), perceptions of value (Krapp, 2002), and epistemological components (Renninger & Hidi, 2002). Interest in its most developed form is marked by a desire for repeated and sustained engagement with a specific domain (Renninger & Hidi, 2011). Interest also has a persistent and reciprocal relationship with perceived self-efficacy beliefs (Fryer & Ainley, 2019; Hidi, Ainley, Berndorff, & Del Favero, 2006). This is important because self-efficacy has strong links

to achievement in higher education contexts (Richardson, Abraham & Bond, 2012), suggesting a mediated pathway to enhancing achievement.

The four-phase model of interest describes how interest can progress within a specific domain, from triggered situational interest, to maintained situational interest, to emerging individual interest, and finally, to well-developed individual interest. Across these phases, an individual's interest moves from being largely affective and externally supported, to being an increasingly internal and persistent resource that supports engagement in a specific domain. The Four-Phase Model is a useful means of understanding the development of interest on an individual level. The model does not translate directly to the highly structured environments (e.g., pre-determined subjects, curricula, time-on-task, etc.) that characterize much of formal education (from elementary to tertiary). Furthermore, the model is not well disposed to explaining how interest develops across a single course of study (e.g., at university), particularly one that is compulsory (i.e., as a requirement to complete a degree course).

A supplementary model that shows promise for explaining how students' interest develops within the constraints of a university course is the task, course, and domain model of interest (Fryer, Ainley & Thompson, 2016). This model describes how interest in tasks set by an instructor might feed into students' interest in a specific course (or might fail to do so; Fryer, et al., 2017). Interest in that course then mediates task interest (from an array of course tasks: e.g., lectures, short writing assignments, groupwork, and quizzes) and can have a broader positive impact in terms of interest in the overall domain of study. This is a practical and empirically straightforward model for understanding how

the complex process described by the four-phase model can unfold across a single course of study.

1.3 The Current Study

The current study is the first in a series within a programme of research that seeks to enhance teaching and learning across coordinated courses within higher education (i.e., any number of courses which are taught by different instructors, but which share content, instructional materials, and assessment). For this programme of research, we were interested in enhancing latent (interest in course) and observed outcomes (achievement and attendance).

The current study also aimed to extend and focus prior research in this area by applying a practical model of interest development across university course experiences (Fryer, Ainley & Thompson, 2016). This refined model of students' reasons to study (interest in the domain and course) is further triangulated by the inclusion of prior standardised achievement results, future exam results, and course attendance. Furthermore, this study builds on higher education research (Leenknecht, Wijnia, Loyens, & Rikers, 2017) which validated and connected the instruction for engagement model in higher education (from perceived control and self-determination theory: Deci & Ryan, 1985; Skinner, 1995) and preliminary, large-scale cross-sectional tests (Ayllón, Alsina, & Colomer, 2019).

The current study built on the research reviewed to this point, which examined the role of instructional experiences within students' interest in a course of study at university and the implications of both course interest and prior domain interest for critical outcomes. To this end, the role of instructional experiences was tested within a

longitudinal model of interest (domain/course-level). Prior competence and domain interest were controlled for. Students' achievement on a semester-end exam and their attendance in the course were included as observed outcomes of the model. Modelling across a semester of study in a carefully coordinated course (15 weeks) with a substantial sample (n = 1000) enabled a re-examination of the relationships that connect the teacher-created learning environments with the motivations-beliefs that students develop towards a course (with clear implications for the domain of study; Fryer, Ainley & Thompson, 2016). Moreover, this modelling enabled us to further develop our theoretical understanding of these important connections and their implications for education (i.e., motivations-beliefs, achievement and course attendance). The current study's hypothesised model, with all tested connections, is presented in Figure 1.

2 Aims

The current study aimed to address two specific research questions. First (RQ1), how are prior domain interest and future course interest related to students' instructional experiences? Second (RQ2), how are students' domain and course interest, as well as students' instructional experiences, related to important observed outcomes such as exam scores and course attendance?

==========Figure 1 About Here==========

3 Methods

3.1 Participants

First-year students studying at one private university in western Japan (There are 86 national, 95 public and 597 private universities in Japan; national universities generally

carry the most prestige.) participated in the current study (n = 1000, Female = 271, Male = 729; aged 18-19; gender division representative of the university overall). The students were enrolled in a two-year compulsory foreign language programme as part of a four-year undergraduate degree (standard at many Japanese universities). The compulsory programme was coordinated, with all classes using identical course materials (textbooks, listening, and reading curricula; Fryer et al., 2010), summative (standardised) assessment (Stewart, Fryer & Gibson, 2013; Stewart, Fryer & Gibson, 2012), and weekly e-learning (Bovee & Fryer, 2011). Students from a total of 34 courses participated, and class sizes ranged from 24 to 38 students. Students attended two classes a week, with one class focusing on listening and speaking skills, and the other focusing on reading and writing. Students came from seven of the university's nine faculties.

Prior to conducting the current study, the education centre governing students' compulsory language studies reviewed it and subsequently granted us permission to proceed. Students were informed of the overall research programme and given the opportunity to opt out of the research project at the outset and at any time during the study.

3.2 Procedures and Instruments

Students completed a standardised language test two weeks prior to the semester of study and a vocabulary test after the final class of the semester. Students completed surveys at three time points across one 15-week semester of classes. Surveys were embedded in the weekly e-learning and were completed online. All survey items utilised a cumulative scale of zero to six, from *nothing like me* to *exactly like me*.

Two scales assessing students' interest at two levels (course and domain level) were utilised. Both interest scales came from an initial study examining interest across tasks, course, and domain levels (Fryer, Ainley & Thompson, 2016), and have been successfully used in recent studies in this area in experimental and longitudinal studies (i.e., Fryer et al., 2017; Fryer & Ainley, 2019). Students' instructional experiences were assessed using three scales: structure (Teacher as a Social Context Questionnaire, e.g., 'My teacher makes sure I understand before he/she goes on'; Skinner & Belmont, 1993); autonomy-support (adapted from Teacher as a Social Context Questionnaire, e.g. 'My teacher encourages me to ask questions'); and control (Controlling Teacher Questionnaire, e.g. 'My teacher tries to control everything I do'; Jang, Reeve, Ryan, & Kim, 2009). For the current study, the autonomy-support and structure scales were combined to create a teaching quality construct which we call Good Teaching (consistent with recent longitudinal research in elementary and secondary schools in Japan; Fryer & Oga-Baldwin, 2019; Oga-Baldwin, Nakata, Parker, & Ryan, 2017).

3.3 Analyses

Analyses began by assessing the composite reliability of each scale (Raykov, 2009). Means and standard deviations along with the latent intercorrelations between the modelled variables were then calculated and examined prior to conducting latent modelling. Configural and then latent longitudinal structural equation models were tested. All latent analyses were conducted using M*plus* 7.4 (Muthén & Muthén, 1998-2015) utilising the Maximum Likelihood Robust (MLR) Algorithm. As the surveys were completed online, missing data was low (< 1%) and addressed through Full Information Maximum Likelihood imputation (FIML). FIML is held to be an effective means of

dealing with reasonable amounts of missing data (Enders, 2010). Models were tested while taking into account students' nesting within classrooms. The design-based correction of standard errors via the complex design option in M*plus* was utilised for all latent models (Muthén & Muthén, 1998-2015). This approach, rather than a multi-level analysis, was pursued because the number of level 2 clusters (i.e., courses) was not sufficient to prevent bias (i.e., < 50; Maas & Hox, 2005).

Longitudinal analyses were conducted with all latent variables modelled predicting all future variables. No paths were removed to improve model fit. The sex of the participants, which is a well-established correlate of an individual's motivations and beliefs (Voyer & Voyer, 2014), was controlled for by including it as a predicting variable for all future constructs (Female = 1, and Male = 2).

For the current study, guidelines suggested by Keith (2015) for interpreting beta coefficients in research on learning influences were used. Keith's guidelines suggest that betas below .05 should be interpreted as 'too small to be considered meaningful'; those above .05 should be considered 'small but meaningful'; those above .10 should be considered 'moderate'; and those above .25 are considered 'large'.

4 Results

The latent pairwise correlations, the composite reliability, means, and standard deviations for each construct are presented in Table 1. The composite reliability for each latent construct was well above that which is generally considered to be acceptable (> .70; Devellis, 2012). The latent pairwise correlations were consistent with both theory and past empirical findings.

==========Table 1 About Here==========

The configural and longitudinal models each fit the data acceptably well (Table 2).

==========Table 2 About Here==========

The finalised model is presented beginning with the controls: Sex and Pre-test (Time 1; T1). Next, T2 domain interest is reviewed. Last, T3 instructional experiences' (external control and Good Teaching, the latter being the latent pairing of students' instructional experiences of autonomy-support and structure), and direct and mediated (through T4 course interest) *ß*s for the model's outcomes (T5 attendance and T6 vocabulary exam) are then presented.

Two statistically significant relationships involving students' sex were present for their instructional experiences. Female students experienced increased quality of teaching (*ß* = -.09) and male students experienced more external controlling teaching (*ß* = .07). The prior standardised listening and reading presented a substantial relationship with the semester-end vocabulary test (*ß* = .62).

Domain interest presented contrasting *ß*s for students' instructional experiences: Good Teaching (*ß* = .34) and Controlling Teaching (*ß* = -.15). Domain interest, accounting for instructional experiences (Good Teaching, *ß* = .49; Controlling Teaching *ß* = -.10), presented a strong connection to future course interest (*ß* = .30) and a moderate relationship with students' performance on the vocabulary exam (*ß* = .16). Course interest (T4) presented the single statistically significant moderate relationship with students' course attendance across the 15 weeks (*ß* = .13). Attendance presented a small relationship with exam performance (*ß* = .05).

The variance explained for the T2 variables was very low (R^2 = .02). The variance explained for students' instructional experiences was low (Good Teaching, R^2 = .13, Controlling Teaching, R^2 = .03). Midterm course interest (R^2 = .45) and exam performance (R^2 = .43) variance explanation were large. The variance explained for attendance was very low (R^2 = .02). The low variance explained in attendance and the single, small β can be partially explained by the institutional rule that all students must attend a minimum of 12 out of 15 classes in order to pass the course. This rule predictably constrained the variance of students' attendance rates and limited its explanatory potential.

==========Figure 2 About Here==========

5 Discussion

The current study was conducted across one semester of classes in a coordinated, compulsory foreign language programme. Explanation for the interconnections between students' reasons for learning (interest at the domain and course level) and instructional experiences (structure and autonomy-support combined as the latent variable Good Teaching, along with Controlling Teaching) was the primary focus of the current study. Prior competence, future exam performance, and attendance were included in modelling to highlight key observed inputs and outputs for these course experiences.

Students' with higher initial domain interest experienced better instruction: increased autonomy-support and structure, and less Controlling Teaching. These students were also more interested in the course, after accounting for their instructional experiences. Accounting for prior domain interest, future course interest was supported by Good Teaching and negatively predicted by controlling instructional experiences (Research

Question #1). Students' course and domain interest presented very different connections with this study's outcomes: Students' domain interest directly, positively predicted course achievement while their course interest was related to increased course attendance (Research Question #2).

The current study set out to establish the role of students' instructional experiences within the development of key latent sources of motivation to learn (i.e., interest), and important observed outcomes like class attendance and achievement. The pairing of good teaching (autonomy-supportive and well-structured) and controlling teaching experiences was an important node for prior domain interest and was found to be a substantial predictor of future sources of course interest. As the first step in a programme of research seeking to enhance these latent foundations for learning in university courses, the present results clearly support the value of interventions that enhance autonomy-supportive and well-structured instructional experiences.

5.1 Theoretical Implications

While the role of students' sex was not a central question for the current study, it was important to control for, and modelling presented a clear pattern of small, but important relationships for both men and women. The fact that all potential statistically significant roles for the sex of the students was mediated by instructional experience was surprising, and holds implications for future research on sex differences within important individual differences such as interest. In the present educational context, female students experienced more high-quality teaching and male students felt more controlled by the classroom instruction. Two questions arise from this finding, the first being: do these relationships primarily reflect actual sex-specific differences in instruction on the part of

the teacher, or differences in student perceptions depending on their sex? If there was an actual difference in the way teachers taught female students, was this primarily related to the students' physical sex, or to other individual differences between male and female students, such as those found in past research (Voyer & Voyer, 2014)? Given that prior domain interest was controlled for, other individual differences would need to be examined.

The role of students' prior interest within future instructional experiences is theoretically consistent with the so-called "Matthew effect (of accumulated advantage)", a long-established and highly practical concept for how success builds on success which is consistent with past and recent findings in secondary schools (i.e., Fryer & Oga-Baldwin, 2019; Belmont & Skinner, 1993). That is to say, students who come to class with a greater measure of interest experience better teaching—teaching characterised by better structure, more autonomy support, and less controlling instruction. This is both a troubling and highly predictable pattern of mediation.

Autonomy-supportive and well-structured teaching experiences function as crucial supports for individual differences such as interest, and mediated thereby to important outcomes such as achievement and attendance. Building on and beyond this, it is essential that we recognise teachers' role as a nexus for fostering key beliefs and motivations to learn (e.g., interest). It is through these beliefs and motivations that educators have considerable potential to foster the adaptive persistence students need to achieve.

Establishing the connections between latent and observed constructs is important in order to clarify precisely how individual differences (e.g., interst) function in a

practical sense. In the current study, course interest predicted attendance, even within the highly restrictive, and therefore low variance, attendance policy environment where the study was conducted. Within higher education, there is a long-running discussion regarding both the importance of attendance (e.g., as an important correlate of achievement; Credé, Roch, & Kieszczynka, 2010) and, in many situations, the difficulty of getting students to attend class (Devadoss & Foltz, 2009 ; Golding, 2011; Persky et al., 2014). Motivation, or lack thereof, has also been explored (e.g., latent modelling of amotivation and course attendance; Fryer, et al., 2018). However, to our knowledge, interest has less often been the focus of research in this area, and the present results suggest that it is a worthwhile line of investigation.

5.2 Practical Implications

Instruction can (and should) support students' motivations to learn. How? Clues are provided by two meta-theories and the theories they build upon, namely structure (perceived control theory; Skinner, 1995) and autonomy-support (self-determination theory; Deci & Ryan, 1985). These theoretical frameworks are both well-established and empirically robust—a rarity for theories with direct applications to pedagogy—and they offer two clear messages for educators. The first is that learning environments should be organised in such a manner so as to support students' sense of control over, and provide feedback on, their learning process (i.e., structure). The second is focused more on the manner in which instructors lecture, conduct discussions, and provide feedback to students, rather than the actual content of those interactions. Consistently supporting students in the development and maintenance of personal reasons for course engagement will foster interest in the course. This increased interest will not only have a number of

well-established latent outcomes, but will also encourage more tangible (observed) outcomes such as course attendance. Both of these theories are rich in empirical applications in a wide variety of contexts, with potential for researchers to develop practical instructional models for interested educators.

The Matthew effect, which may arise from instructors recognising students' interest in the topic of study and subsequently rewarding such students with a greater level of support, may be of trivial concern as it manifests across a single semester or even a single academic year, but amplified across multiple years of education, the effect could contribute to a large and ever widening gap. Unfortunately, this is a very difficult boat to pivot, as recognising and rewarding interest is a highly intuitive response exhibited by parents, mentors, and educators alike. The counterintuitive response involves providing increased support to disinterested students with an aim to help them develop their own interest. While this may not be difficult to do intermittently, it can prove much more challenging to implement as a consistent instructional strategy. Yet, consistency is precisely what is required in order to help all students, not only those who come to a learning environment already interested in the topic of study.

Addressing the apparent discrepancies in instruction for male and female students should be more straightforward, simply due to the relative ease in recognising these subgroups. Instructors need to self-regulate their instruction to ensure their teaching approaches are unbiased with regard to students' sex. Regular peer evaluations (from other instructors) might be one supportive strategy to help teachers regulate behavioural biases of which they may be unaware.

The last practical note involves an issue that is relevant to all educators in and outside compulsory education: attendance. While there is meta-analytic consensus pointing to the overwhelming importance of attendance for achievement (Crede et al., 2010), an academic debate regarding necessity of students coming class remains unresolved. This debate aside, most educators want students to attend as many classes as possible, but often remain unsure as to how they can encourage this outcome short of external control in the form of grades. Evidence suggests that fostering interest is an effective approach. This is not to suggest that getting students interested is easy. The first step involves making 'getting students interested' a curricular goal. Once educators do this and begin searching for strategies to make this possible, they can rely on a rich and constantly growing literature describing interest development (recent book-length examples; Renninger & Hidi, 2017; O'Keefe, & Harackiewicz, 2017). In addition, there are a growing number of publications suggesting practical strategies for enhancing students' interest development across all levels of education (e.g., Harackiewicz, Smith, Priniski, et al., 2016; Renninger et al., 2014; Hulleman, Godes, Hendricks, Harackiewicz, 2010).

6 Limitations and Future Directions

A number of limitations to the current study should be understood and addressed by future research in this area. Firstly, this study needs to be replicated in other domains of study, institutions, and cultural contexts. The present study was undertaken in a compulsory course. While such courses are common in higher education, a replication in an elective course is important to test the external validity of this study's findings. For all

such replications to meaningfully add to the current study, it is essential that they apply the same rigorous longitudinal design and latent analyses.

In addition to replications, interventions focusing on changing students' instructional experiences need to be undertaken. Such replications should be applied as long-term teaching and learning strategies that are sustainable throughout a course of study.

The attendance rules for the courses in the current study had an unmistakable impact on the results. At minimum, these rules impacted the amount of variance explained in students' course attendance by the model. Future tests in courses lacking mandatory attendance rules should reveal a clearer picture of the effects of individual differences and students' instructional experiences on course attendance.

7 Conclusion

The current study was a replication and extension of well-established research undertaken within earlier years of formal education (e.g., Fryer & Oga-Baldwin, 2019; Jang et al., 2012; Jang, et al., 2010; Belmont & Skinner, 1993) as well as nascent research in the area of higher education (e.g., Ayllón, et al., 2019; Leenknecht, et al., 2017). A reciprocal model for instructional experiences and important individual differences was tested. The robust longitudinal role of instructional experiences within students' future course interest was confirmed. Students' interest in the course predicted their course attendance and their prior domain interest predicted future exam achievement.

Instructors in higher education, as with educators for younger students, play a consequential role in fostering motivations-beliefs for learning. Theory, empirical evidence, and common sense all indicate that interest is a crucial component and outcome

of education. Interest is particularly critical for domains of study such as language that demand sustained, lifelong re-engagement (Fryer, 2019). Yet, the presence of student interest is too often assumed in higher education; it has a tendency to be treated as an unspoken prerequisite, a pedagogical afterthought. At various levels, from the institutional and curricular, to the lecture and tutorial, it is our hope that educators will draw on the present findings, and the research on which it builds, to start making courses an experience that generates interest and motivation to learn.

8 References

Ainley, M., & Hidi, S. (2014). Interest and enjoyment. In R. Pekrun & L. Linnenbrink-Garcia (Eds.), *International handbook of emotions in education* (pp. 205-227). New York: Routledge.

Ainley, M., Buckley, S., & Chan, J. (2009). Interest and Efficacy Beliefs in Self-Regulated Learning. In M. Wosnitza, S. Karabenick, A. Efklides, & P. Nenniger (Eds.), *Contemporary motivation research: From global to local perspectives* (pp. 207-228).

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261-267. doi: 10.1037/0022-0663.84.3.261

Ayllón, S., Alsina, Á., & Colomer, J. (2019). Teachers' involvement and students' self-efficacy: Keys to achievement in higher education. *Plos One, 14*, e0216865. doi:10.1371/journal.pone.0216865

Belmont, M., Skinner, E., Wellborn, J., & Connell, J. (1988). *Teacher as Social Context (TASC). A measure of student perceptions of teacher provision of involvement, structure, and Autonomy Support.*

Bovee, H., & Fryer, L. K. (2011) オンライン CALL システムに関する開発経過報告。九州産業大学 COMMON, 31. Retreived from http://ci.nii.ac.jp/naid/40019173226/

Credé, M., Roch, S. G., & Kieszczynka, U. M. (2010). Class Attendance in College: A Meta-Analytic Review of the Relationship of Class Attendance With Grades and Student Characteristics. *Review of Educational Research, 80*(2), 272-295. doi:10.3102/0034654310362998

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology, 53*(6), 1024.

Devadoss, S., & Foltz, J. (1996). Evaluation of factors influencing student class attendance and performance. *American Journal of Agricultural Economics, 499–507*, 499–507. doi:http://www.jstor.org/stable/1243268

Devellis, R. F. (2012). *Scale Development: Theory and application* (3rd ed.). Thousand Oaks, CA: Sage.

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Press.

Fryer, L. K., Anderson, C. J., Stewart, J., Bovee, H. N., & Gibson, A. (2010). Coordinating a vocabulary curriculum: Exploration, pilot, trial and future directions. Paper presented at The Japan Association for Language Teaching national conference, Nagoya. Retrieved from http://jalt-publications.org/proceedings/issues/2011-10_2010.1

Fryer, L. K., Ainley, M., & Thompson, A. (2016). Modelling the links between students' interest in a domain, the tasks they experience and their interest in a course: Isn't interest what university is all about? *Learning and Individual Differences, 50*, 157-165. doi:10.1016/j.lindif.2016.08.011

Fryer, L. K., Ainley, M., Thompson, A., Gibson, A., & Sherlock, Z. (2017). Stimulating and sustaining interest in a language course: An experimental comparison of Chatbot and Human task partners. *Computers in Human Behavior, 75*, 461-468. doi: 10.1016/j.chb.2017.05.045

Fryer, L. K., Ginns, P., Howarth, M., Anderson, C. J., & Ozono, S. (2018). Modelling students' individual differences in attendance: Why do students skip class? *Educational Psychology. 38, 470–486.* doi: 10.1080/01443410.2017.1403567

Fryer, L.K. (2019). Getting interested: Developing a sustainable source of motivation to learn a new language at school. *86, 102–120*. *System.* doi:10.1016/j.system.2019.102120

Fryer, L. K. & Ainley, M. (2019). Supporting interest in a study domain: A longitudinal test of the interplay between interest, utility-value, and competence beliefs. *Learning and Instruction. 60, 252-262.* doi: 10.1016/j.learninstruc.2017.11.002

Fryer, L. K. & Oga-Baldwin, W. (2019). Succeeding at junior high school: Students' reasons, their reach and the teaching that h(inders)elps their grasp. *Contemporary Educational Psychology. 59.* doi: 10.1016/j.cedpsych.2019.101778.

Golding, J. M. (2011). The role of attendance in lecture classes: You can lead a horse to water... *Teaching of Psychology, 38*, 40-42. doi:10.1177/0098628310390915

Grolnick, W. S., & Ryan, R. M. (1987). Parent styles associated with children's self-regulation and competence in school. *Journal of educational psychology, 81*, 143-.

Harackiewicz, J. M., Smith, J. L., & Priniski, S. J. (2016). Interest matters: the importance of promoting interest in education. *Policy Insights from the Behavioral and Brain Sciences*, 1-8. doi:10.1177/2372732216655542

Hidi, S., & Ainley, M. (2008). Interest and self-regulation: Relationships between two variables that influence learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research, and applications* (pp. 77-109). Mahwah, NJ: Lawrence Erlbaum Associates.

Hidi, S., Ainley, M., Berndorff, D., & Del Favero, L. (2006). The Role of Interest and Self-Efficacy in Science-Related Expository Writing. In S. Hidi & P. Boscolo (Eds.), *Writing and motivation* (pp. 203). UK: Emerald Group.

Hidi, S., Berndorff, D., & Ainley, M. (2002). Children's argument writing, interest and self-efficacy: an intervention study. *Learning and Instruction, 12*(4), 429-446. doi:10.1016/s0959-4752(01)00009-3

Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*, 111-127. doi:10.1207/s15326985ep4102_4

Hulleman, C. S., Godes, O., Hendricks, B., & Harackiewicz, J. (2010). Enhancing interest and performance with a utility value intervention. *Journal of Educational Psychology, 102*(4), 880.

Jang, H., Kim, E. J., & Reeve, J. (2012). Longitudinal test of self-determination theory & motivation mediation model in a naturally occurring classroom context. *Journal of Educational Psychology, 104*, 1175-1188. doi:10.1037/a0028089

Jang, H., Reeve, J., & Halusic, M. (2016). A new autonomy-supportive way of teaching that increases conceptual learning: teaching in students' preferred ways. *The Journal of Experimental Education, 84*, 686-701.

Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 102*, 588-600.

Jang, H., Reeve, J., Ryan, R. M., & Kim, A. (2009). Can self-determination theory explain what underlies the productive, satisfying learning experiences of collectivistically oriented korean students? *Journal of Educational Psychology, 101*, 644-661. doi:10.1037/a0014241

Keith, T. Z. (2015). *Multiple regression and beyond: An introduction to multiple regression and structural equation modelling* (2nd ed.). New York: Routledge.

Krapp, A. (2002). Structural and dynamic aspects of interest development: Theoretical considerations from an ontogenetic perspective. *Learning and Instruction, 12*, 383-409. doi:10.1016/S0959-4752(01)00011-1

Leenknecht, M. J. M., Wijnia, L., Loyens, S. M. M., & Rikers, R. M. J. P. (2017). Need-supportive teaching in higher education: Configurations of autonomy support, structure, and involvement. *Teaching and Teacher Education, 68*, 134-142. doi:https://doi.org/10.1016/j.tate.2017.08.020

Maas, C. J. M., & Hox, J. L. (2005). Sufficent sample sizes for multilevel modeling. *Methodology, 1*, 86. doi: 10.1027/1614-2241.1.3.86.

Muthén, L. K., & Muthén, B. O. (1998-2015). *Mplus user's guide.* (Sixth ed.). Los Angeles, CA: Muthén & Muthén.

Oga-Baldwin, W. L. Q., Nakata, Y., Parker, P., & Ryan, R. M. (2017). Motivating young language learners: A longitudinal model of self-determined motivation in elementary school foreign language classes. *Contemporary Educational Psychology, 49*, 140-150. doi:http://dx.doi.org/10.1016/j.cedpsych.2017.01.010

O'Keefe, P. A., & Harackiewicz, J. M. (Eds.). (2017). *The Science of Interest*. New York: Springer.

Persky, A. M., Kirwin, J. L., Marasco, C. J., May, D. B., Skomo, M. L., & Kennedy, K. B. (2014). Classroom attendance: Factors and perceptions of students and faculty in US schools of pharmacy. *Currents in Pharmacy Teaching and Learning, 6*(1), 1-9.

Raykov, T. (2009). Evaluation of scale reliability for unidimensional measures using latent variable modeling. *Measurement and Evaluation in Counseling and Development, 42*, 223–232. doi:10.1177/0748175609344096

Renninger, K., Hidi, S. (2017). The power of interest for motivation and engagement. New York: Routledge.

Renninger, A, Austin, L., Bachrach, J. E., Chau, A., Emmerson, M. S., King, B. R., et al. (2014). Going Beyond the "Whoa! That's Cool!" of Inquiry: Achieving Science Interest and Learning with the ICAN Intervention. In *Motivational Interventions* (6 ed., Vol. 18, pp. 107–138). Emerald Group Publishing Limited. http:10.1108/S0749-742320140000018003

Renninger, K. A., & Hidi, S. (2011). Revisiting the conceptualization, measurement, and generation of interest. *Educational Psychologist, 46*, 168-184. doi:10.1080/00461520.2011.587723

Renninger, K. A., & Hidi, S. (2002). Student interest and achievement: Developmental issues raised by a case study. In A. W. J. S. Eccles (Ed.), *Development of achievement motivation* (pp. 173–195). New York, NY: Academic Press.

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 138*, 353-387. doi:10.1037/a0026838

Ryan, R. M., & Grolnick, W. S. (1986). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *Journal of Personality and Social Psychology, 50*, 550-558.

Ryan, R., & Deci, E. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. *New York: Guilford Publishing*.

Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2014). Student Engagement in High School Classrooms from the Perspective of Flow Theory. In *Applications of Flow in Human Development and Education: The Collected Works of Mihaly Csikszentmihalyi* (pp. 475-494). Dordrecht: Springer Netherlands.

Skinner, E. A. (1995). *Perceived control, motivation, & coping. London: Sage* (Vol. 8).

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher-behavior and student engagement across the school year. *Journal of Educational Psychology, 85*, 571-581. doi:10.1037//0022-0663.85.4.571

Skinner, E. A., Chapman, M., & Baltes, P. B. (1988). Control, means ends, and agency beliefs - a new conceptualization and its measurement during childhood. *Journal of Personality and Social Psychology, 54*, 117-133.

Skinner, E. A., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology, 100*, 765-781. doi:10.1037/a0012840

Skinner, E. A., Wellborn, J. G., & Connell, J. P. (1990). What it takes to do well in school and whether I've got it: A process model of perceived control and children's engagement and achievement in school. *Journal of Educational Psychology, 82*, 22-32. doi:10.1037//0022-0663.82.1.22

Stewart, J., Gibson, A. & Fryer, L. K. (2012). Examining the reliability of a TOEIC Bridge practice test under 1 and 3 parameter item response models. *Shiken Research Bulletin,* 16, 8-14. Retrieved from teval.jalt.org/sites/teval.jalt.org/files/SRB-16-2-Full.pdf

Stewart, J., Fryer, L. K., & Gibson, A. (2013). Assessing the dimensionality of three hypothesized sub-skills of vocabulary proficiency. *Japanese Journal of College English Teachers Journal.* 56, 57-71. Retrieved from http://ci.nii.ac.jp/vol_issue/nels/AA12208671/ISS0000489109_en.html

Vansteenkiste, M., Simons, J., Lens, W., & Sheldon, K. A. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology, 87*, 246-260. doi:10.1037/0022-3514.87.2.246

Voyer, D., & Voyer, S. (2014). Gender differences in scholastic achievement: A meta-analysis. *Psychological Bulletin, 140*, 1174-1204. doi:10.1037/a0036620

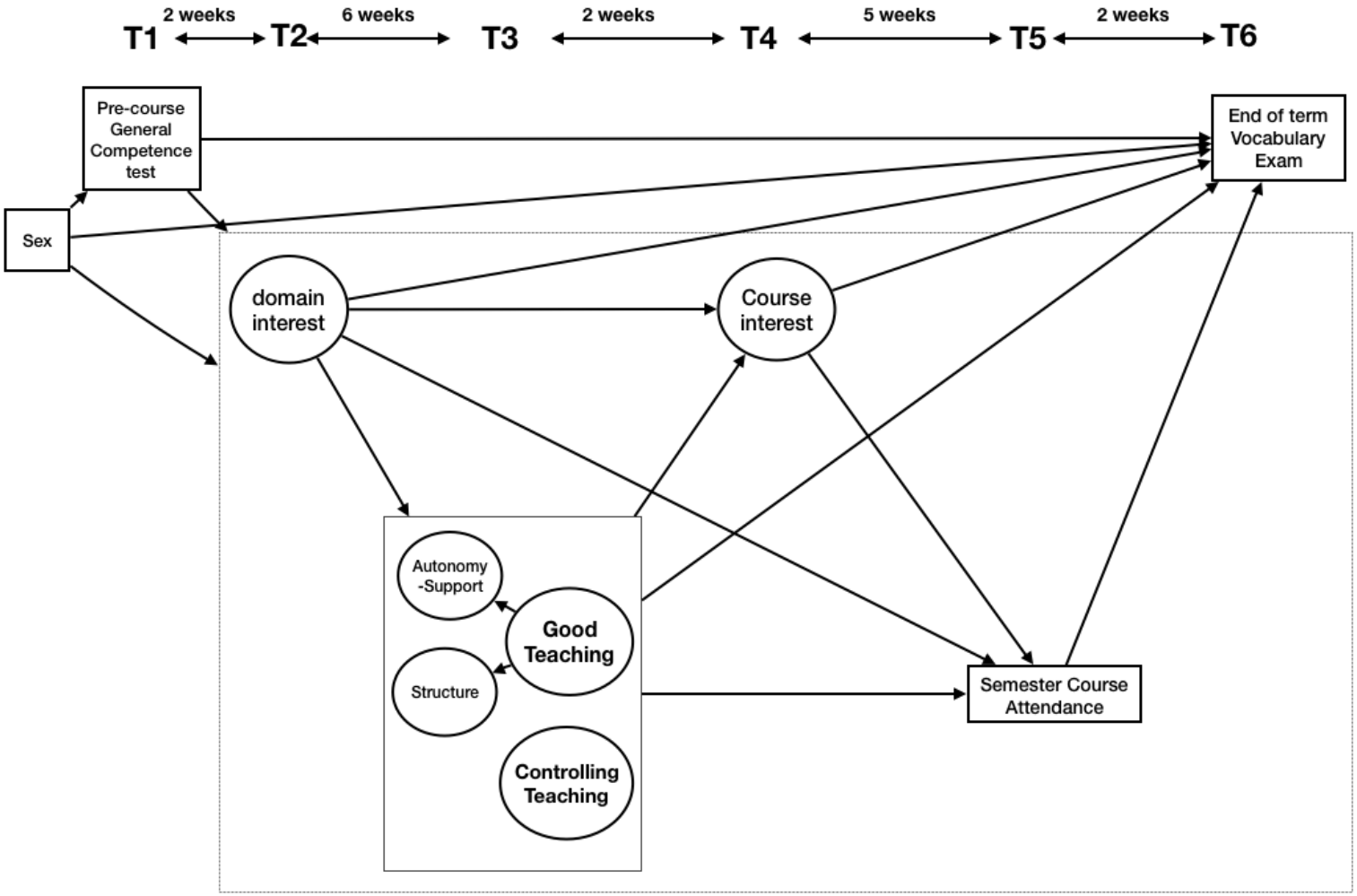

Figure 1. Hypothesised Model

Table 1. Correlations, Means, Standard Deviations and Reliability

	Pre-Test T1	Domain interest T2	Controlling Teaching T3	Good Teaching T3	Course Interest T4	Attendance T5	Vocabulary Exam T6
Pre-Test T1	1.00						
Domain interest T2	.12*	1.00					
Controlling Teaching T3	.07	-.15**	1.00				
Good Teaching T3	.11**	.34**	-.20**	1.00			
Course Interest T4	-.07	.48**	-.24**	.59**	1.00		
Attendance T5	-.03	.00	-.06	.04	.10**	1.00	
Vocabulary Exam T6	.63**	.23**	-.10**	.11**	.12**	.04	1.00
Mean	48.38	4.57	4.17	4.34	3.18	13.90	11.85
SD	12.63	1.30	1.40	1.28	1.18	1.30	4.23
Raykov's RHO		.83	.85	.87	.84		

** < .01; * < .05

Table 2. Model Fit

	Chi-Square	CFI	TLI	RMSEA (90% C.I.)
Configural model	10519.628(351)	0.96	0.95	.039 (.032-.039)
Final Longitudinal model	10513.818(351)	0.96	0.95	.035(.031-.038)

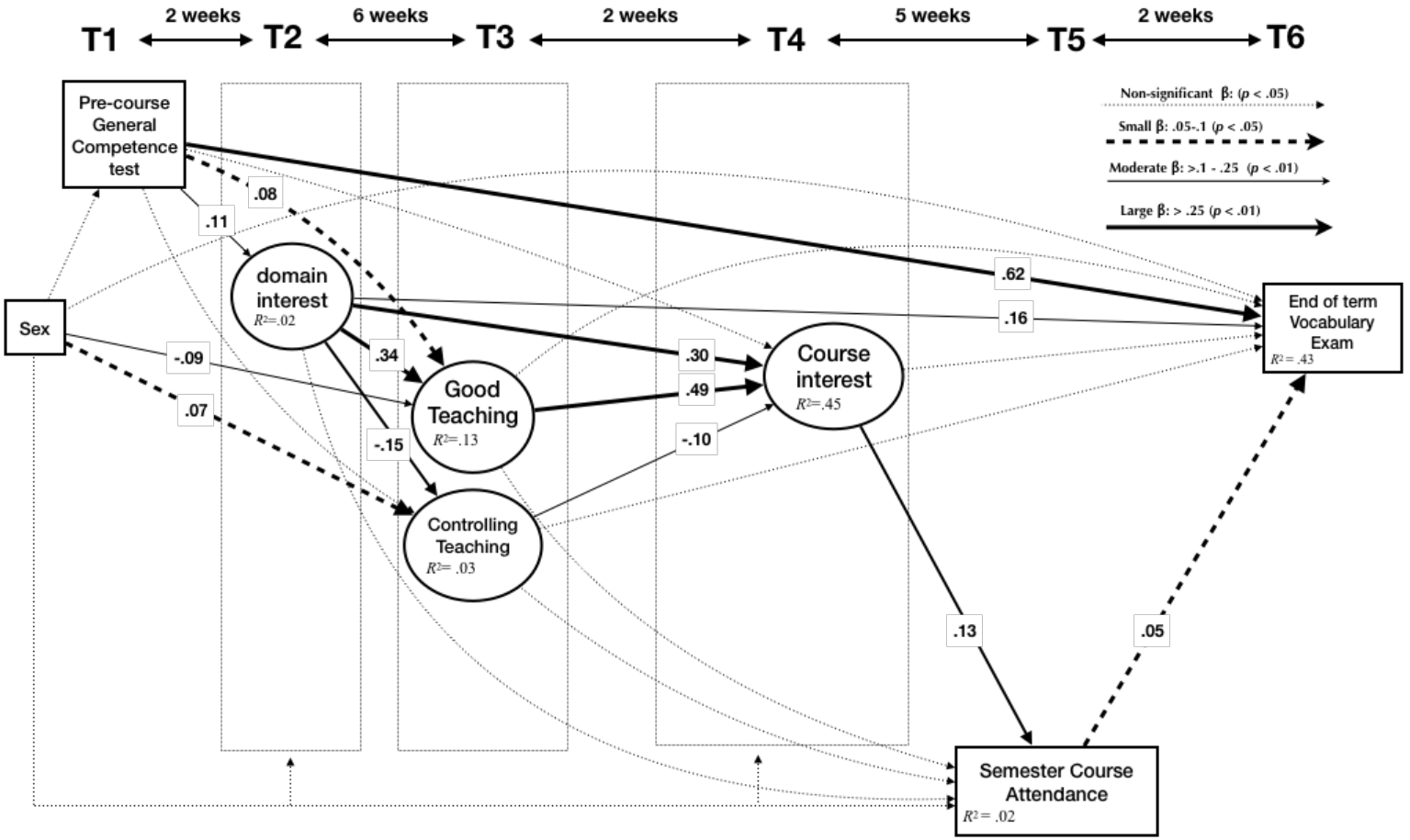

Figure 2. Final Model