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The Influence of an Autonomy-Supportive Intervention on Preservice Teacher Instruction: A Self-Determined Perspective

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Abstract: The purpose of this study was to examine the influence of an autonomy-oriented intervention on preservice teacher's instructional behaviors and perceptions. A total of 28 preservice physical education teachers enrolled in a secondary physical education methods course were randomly assigned to either the treatment (N=14) or control group (N=14). Data were collected using a pretest/posttest design measuring perceptions and observation of autonomy-support, as well as student motivation. Data analysis utilized repeated measures ANOVAs to examine differences. Results indicated significant changes in autonomy-support for both teachers and students exposed to the intervention.

Introduction

Motivation is and has been a popular topic of research within both the general (Stipek, 2003) and physical education fields (Chen, 2001). This popularity can be attributed to the variety of positive student experiences associated with higher levels of student motivation (Vallerand & Losier, 1999; Deci & Ryan, 1985; 2004). For instance within physical education, Ntoumanis (2001) found that motivation is strongly correlated with student engagement in activity both inside and outside the school setting. While motivation is important to the individual and their development as a student, a primary influential factor on their motivation is the social context (Deci & Ryan, 1985). Development of the social context is strongly impacted by the person in authority (i.e. teacher) and the style of instruction utilized within the educational setting (Turner & Patrick, 2004; Deci & Ryan, 2004). The issue within education is that teachers commonly utilize instructional behaviors that are unsupportive of student motivation (Reeve, 2009).

Theoretical Perspective of Motivation

This study is grounded in the self-determination theory (SDT) of motivation (Deci & Ryan, 1985). SDT has become a popular motivational framework within the educational literature and research, due to (a) the strong association with higher levels of learning (Chen, 2001) and (b) is a robust motivational theory that has been applied within a variety of educational settings (Deci & Ryan, 2004). SDT posits that individual motivation (*why we engage in specific behaviours*) is initially influenced by the social context, which supports students key psychological needs and in turn relates to a students level of motivation or self-determination (Deci & Ryan, 1985; 2000) (See Figure 1).

<u>Social Context</u>	<u>Psychological Needs</u>	<u>Motivational Levels</u>
Climate	Autonomy	Intrinsic
	Competence	Extrinsic
	Relatedness	Amotivation

Figure 1. Linear path of student motivation explained by self-determination theory. Modified from Deci & Ryan 1985; 2000

While support for students psycho-social needs (*autonomy* – feeling of control, *competence* – perception of success and *relatedness* – sense of caring/empathy) and individual motivation (*intrinsic* – internal motives; *extrinsic* - external motivates and *amotivation* – lack of motivation) are important student focused constructs, the social context (a) plays an integral part in the motivational process and (b) is the only aspect which can be manipulated by the teacher. As such, this paper is focused on the development and implementation of a motivationally supportive social context. Deci & Ryan (2004) indicated that a person in an authoritative position (e.g. teacher) could utilize a style of instruction that range between highly controlling or highly autonomous. Reeve, Jang, Carrell, Jeon and Barch (2004) articulate the differences between instructional styles whereby a controlling teacher will utilize strategies and techniques that focus on external control (e.g. deadlines), provides pressuring statements (e.g. “must” or “have to”), neglect the importance of a task and ignore students who demonstrate negative affect. On the contrary, highly autonomous instruction is focused on internal motives (e.g. enjoyment), uses informational and flexible language (e.g. “could” or “might”), provides students with meaningful learning tasks and is empathetic to students who demonstrate negative affect.

SDT related literature indicates students are influenced by the instruction of their teachers (Reeve, 2006), in particular are the positive benefits when engaged in a highly autonomy-supportive setting. For instance, physical education students engaged in a highly autonomy-supportive social context reported higher levels of psychomotor, cognitive and affective learning (Lonsdale, Sabston, Raedeke, Ha & Sum, 2009; Vazou-Ekkekakis & Ekkekakis, 2009; Lim & Wang, 2009)

There is overwhelming literature that supports the positive student benefits of being exposed to an autonomy-supportive social context, yet teachers commonly and primarily utilize controlling behaviors (Reeve, 2009). The use of controlling behaviours can be attributed to aspects such as the prescriptive nature (e.g. Board of Studies Syllabus telling teachers what students need to learn) of schools (Ryan & Grolnick, 1986). Of particular importance to this study; Sarrazin, Tessier, Pelletier, Trouilloud and Chanal (2006) found that physical educators are no different from classroom teachers in using controlling strategies as a means of instruction. Understanding the applied student benefits (e.g. higher levels of learning) of engagement within a highly autonomy-supportive environment and the common teacher practices of using controlling strategies, it is critical to examine interventions that enhance the development of teacher instruction related to providing an autonomous climate.

Currently, a limited number of studies have examined intervention-based programs on developing autonomous instruction (Reeve, 1998; Reeve et al., 2004; Tessier et al., 2008; Tessier et al., 2010). The initial work of Reeve (1998) found that engaging preservice teachers in an autonomy-oriented intervention facilitated significant changes in perceived autonomy-support within their instruction. A primary limitation within the Reeve (1998) study was the use of perception data. As such, Reeve et al. (2004) conducted an intervention to investigate observation of autonomous instructional behaviours and found similar positive results as the previous Reeve (1998) study. While the aforementioned studies illustrate the influence of an autonomy-oriented intervention of motivationally supportive instruction, the observational tool did not allow for the orthogonal aspect of an autonomy-supportive learning

context. Autonomy and control might be at polar ends of the psychosocial spectrum, yet the absence of one does not mean the other is present (Silk, Morris, Kanya & Steinberg, 2003). The latest studies by Tessier, Sarrazin and Ntoumanis (2008; 2010) utilized an observational tool that took into account the orthogonal limitations and found that physical education teachers were (a) more autonomous within their instruction and (b) students were more supported in their psychosocial needs and motivation during secondary sport-based physical education. While previous studies illustrate the influence of an autonomy-oriented intervention on teacher behaviour, the combined body of knowledge is not without limitations. First, each of the previous observational studies were limited to a relatively small sample size (under 5 participants). In addition, the lack of a control group raises concern for the generalization of results. Therefore, the purpose of this study was to examine the influence of an autonomy-oriented module on preservice teachers teaching behaviors. Specifically, this study examined the following research questions:

- Does an autonomy-supportive intervention change the teaching behaviors (i.e. student interactions related to autonomy, controlling and neutral statements) of preservice physical education teachers?
- Did students exposed to either treatment group change their perceptions of autonomy-support and/or level of motivation?

Method

Participants and Setting

Participants within this study were 28 (Male=18; Female=10) physical education preservice teachers (PTs) enrolled in a secondary physical education methods course from an accredited tertiary university. The course lasted an academic semester (16 weeks) utilizing a combined lecture/field experience format. Lectures were conducted twice per week (60 minutes each day) and accompanied by a school-based field experience. Content taught within the lecture focused on the development of pedagogical and content knowledge within secondary physical education.

Field experiences were conducted with 659 (Male=333; Female=326) Year-9 students from 3 local schools. Units of study within the secondary schools Year-9 program focused around teaching a variety of games and sports using a combined Sport Education (Siedentop, 1994) and tactical-approach (Griffin, Mitchell & Oslin, 2003). Field experience began with a 2-week observation/teacher-assistance phase, followed by designing and delivering an 8-lesson sport-based unit. Field experience teaching was done individually during the entire unit. Upon completion of the 2-week observation/teacher-assistance phase, PTs were provided guidelines for lesson content and were instructed that class and lesson ownership was their responsibility. The role of the university supervisor and cooperating teacher were to provide instructional feedback and support during and after all lessons.

An individual unaffiliated with the study conducted assignment of PTs to a treatment group randomly. As such, 2 groups of 14 PTs were assigned to either the autonomy-supportive intervention treatment or a control group. It is important to note that the researcher and course instructor were blind to the PT assignments to assist in controlling for potential bias in regards to the delivery of instruction and feedback provided within the course.

Autonomy-Supportive Intervention

PTs within the treatment group were engaged in an online autonomy-supportive training program, which provided an overview of the self-determination theory (Deci & Ryan, 1985), benefits of autonomy-supportive teaching (Tessier, et al., 2008; Deci & Ryan, 2002; 2004), behaviours of autonomy-supportive teaching (Reeve et al., 2004; Reeve & Jang, 2006) and strategies by which to infuse autonomous principles into practice (Tessier, et al., 2008). Much of the instructional principles were based on the works of Reeve and colleagues (1999; 2004; 2006; 2009), whereby training focused on enhancing PT pedagogy to include aspects of (a) nurturing internal motives, (b) provide explanatory rationales, (c) use informational, non-controlling language, (d) acknowledge/accept negative affect, and (e) demonstrating patience (Reeve, et al., 2004).

Nurturing internal motivational resources involved the identification and implementation of learning experiences that are relevant and meaningful to the student. PTs were instructed to “find ways to coordinate the instructional activities they offer with students’ preferences, interests, sense of enjoyment, sense of challenge, competencies, and choice-making” (Reeve, 2006, p. 229). Providing rationales focused on developing (e.g. within lesson plans and during reflections) and implementing statements that were meaningful to their student populations (e.g. why is this important to the student and their learning or development). Language is critical to the teaching-learning process. As such, PTs were instructed to focus on using autonomy-supportive words when delivering instruction (“could” or “might”) and decrease the amount of controlling or pressuring language (e.g. “have to”). Acknowledge / acceptance of negative affect was focused on assisting PTs to be caring and empathetic to students who demonstrate negative behaviour(s) toward aspects of a lesson. Within the PTs teaching, they were instructed to allow students enough time to adequately respond or demonstrate a level of learning before providing an answer. In addition, PTs were instructed to offer hints to guide the student(s) toward a correct response.

Delivery of the autonomy-supportive intervention was conducted online using the secondary physical education methods course webpage. All PTs were required to use the course webpage for a variety of reasons (e.g. submit assignments, access to lecture notes, etc.) and have been familiar with the online technology (i.e. all previous courses have utilized the same online platform). PTs assigned to the treatment group were the only individuals provided access to the autonomy-supportive module. Access to the treatment module was provided after the first field experience teaching day. PTs were asked to complete the module within the first two weeks of the field experience. Accountability within the module required PTs to develop sample lesson plans, mini-tasks and instructional statements that illustrated their ability to plan a lesson while infusing autonomy-supportive principles. Once all materials and tasks were developed, an expert in the field of self-determination and autonomous instruction unaffiliated with the study provided a secondary check that all information was appropriate and accurately represented the intent of the intervention. In addition, during implementation the same expert supported PTs in their understanding of content (e.g. feedback) and checked that all PTs completed the online module.

Measures

Teacher Instruction

Examination of PT instruction utilized the observational grid developed by Sarrazin, et al., (2006). Each lesson was video and audio recorded to allow for analysis of teacher-student interactions, in regards to fifteen categories (See Table 1 for the verbal interactions,

definitions and examples taken directly from the work of Sarrazin, et al., 2006). Coding focused on teacher initiated behaviors directed toward individual students (Sarrazin, et al., 2006). Collection of data was coded for each lesson and provided a frequency within categories (e.g. encouragements) per student. Data were converted into a summation of total frequencies for each category per lesson. A secondary analysis provided each PT with an overall score for autonomy (Categories 3+5+6+9+15), controlling (Categories 1+8+11+12+13+14) and neutral (Categories 2+7+10) instruction (Reeve & Jang, 2006; Tessier et al., 2008). It should be noted, that the category of '*Praises*' was omitted within the analysis due to the inability to adequately classify as autonomous or controlling (Deci, Koestner & Ryan, 1999; Henderlong & Lepper, 2002). The observational tool has been found to be adequately reliable (mean alpha level of .75) and validated for both content and construct for use within physical education (Sarrazin, et al., 2006).

Types of Verbal Interactions	Definitions	Examples
Organizational Communication told		
1. in a controlling way	Frequency of the organizational commands that the student must, hast, or ought to do something.	“You must move into the left-hand line”
2. in a neutral way	Frequency of organizational statements for which the tone is neither controlling nor autonomy-supportive.	“Bring the springboard please”
3. in an autonomy-supportive way	Frequency of statements that provide choice in the organization of the material.	You can choose the group you want”
Technical or tactical hints told		
4. in a controlling way	Frequency of technical or tactical directives that impose a motor skill on the student.	“Extend the arms, I have told you that 10 times”
5. in a neutral way	Frequency of technical or tactical statements for which the tone is neither controlling nor autonomy-supportive, the intention is above all to make the student progress.	“Bend your leg at the reception of the jump you will succeed better”
6. in an autonomy-supportive way	Frequency of suggestions that encourage pupils to take initiatives and to solve problems independently.	“Maybe you could try different positions to jump over this obstacle and choice the best”
Questions asked		
7. in a controlling way	Frequency of directives posed as a question.	“What have I just said, Paul?”
8. in a neutral way	Frequency of questions for which the tone is neither controlling nor autonomy-supportive.	“Is it your last try?”
9. in an autonomy-supportive way	Frequency of questions that provide choices to the pupil.	“Which exercise do you want to start with?”
10. Praises	Frequency of verbal approvals of the student’s performance.	“Well done!” “Good job!”
11. Encouragements	Frequency of pep-talk statements to boost the student’s effort.	“Now you’re getting the hang of it; let’s go!”

12. Perspective-talking statements	Empathic statement reflecting an understanding of the student's perspective.	"I can see that you are starting to be tired"
Negative Communications related to		
13. student's social behaviors	Frequency of directives intended to restore discipline into the classroom.	"Shut up Paul!"
14. student's work	Frequency of directives meant to emphasize the lack of efforts and which could be sarcastic.	"Do not do too much, you will wear away the apparatus!"
15. Criticisms	Frequency of hurtful statements.	"You are completely numskull!"

Table 1. Observational grid of autonomous instruction (Sarrazin, et al. 2006)

Teacher Perceptions of Autonomy-Support

Assessment of PTs perceptions of their autonomy-support was examined using the Problems in Schools questionnaire (PIS; Deci, Schwartz, Sheinman & Ryan, 1981). The PIS asked PTs to read a vignette and individually rate 4 separate items, using a 7-point Likert Scale (1="very inappropriate"; 7="very appropriate"). Each PT completed a total of 8 vignettes and 32 items. Subscale scores for highly controlling (HC), moderately controlling (MC), moderately autonomy-supportive (MA) and highly autonomy-supportive (HA) were calculated through average score of the responses to each item within the subscale. In addition, to provide an overall perception of autonomy-support, subscale scores were calculated using the following $(2*HA) - [MC + (2*HC)]$ (Reeve, Bolt & Cai, 1999). Omission of MA within the overall autonomy-support analysis was based on the recommendation of Reeve et al. (1999) whom indicated this calculation is more representative of a teacher's level of autonomy. Deci et al. (1981) and Reeve et al. (1999) have indicated adequate internal consistency ($\alpha >.80$) and external validity for use of the PIS with secondary educators.

Student Perceptions of Autonomy-Support

To assess student's perceptions of autonomy support of the PT within the physical education field experience, students responded to the 15-item Learning Climate Questions (LCQ; Williams & Deci, 1996). LCQ questions were modified for use within the physical education context based on the work of Standage, Duda and Ntoumanis (2005). Each item utilized a 7-point Likert scale (1="strongly disagree"; 7="strongly agree"). Perceptions of autonomy-support were calculated by reverse scoring appropriate items and calculating an average score on all items for each student. Higher scores are representative of higher perceptions of autonomy-support. Standage, Duda and Ntoumanis (2005) indicated high internal consistency and alpha levels ($>.90$) for use within secondary physical education.

Student Motivation

Assessment of student motivation was conducted through an abridged version of the Sport Motivation Scale (SMS; Pelletier, Fortier, Vallerand, Tuson, Brière & Blais, 1995). Each year-9 student was asked to rate their level of agreement on 15-items using a 7-point Likert scale (7='strongly agree' and 1='strongly disagree'). Answers are averaged into four subscales that provide each student with a level of intrinsic motivation, identified regulation, external regulation and amotivation. This information is further analyzed to provide an overall level of student motivation using the following calculation $((2* \text{intrinsic motivation}) + \text{identified regulation}) - (\text{external regulation} + (2* \text{amotivation}))$. Use of the SMS within physical education has been viewed as possessing appropriate internal consistency ($\alpha >.75$) and construct validity (Ward, Wilkinson, Vincent & Prusak, 2008).

Data Collection and Analysis

Before beginning the study, all participants provided informed consent and Internal Review Board approval was granted by the University. This study implemented a pretest/posttest design. PTs completed the PIS before the first practical (Day 1 of 4-week teaching unit) and at the end of their practical teaching sessions (Final Day of the 4-week unit). In addition, students exposed to the teaching were asked to complete the LCQ and SMS after the first and last teaching day. All students were provided an initial 2-week phase, whereby the students became familiar with the style of PT instruction (e.g. baseline). Videotaped lessons were conducted during the initial two and final two teaching days. A video camera was placed in an area of the gymnasium that (a) was unobtrusive and (b) provided adequate viewing of all students. To assist in the collection of teacher-student interactions, each PT wore a wireless microphone.

Before analysis of survey data, pretest and posttest scores from the PIS, LCQ and SMS were entered and checked for accuracy using a third party. Coding of videotaped lessons was conducted by a researcher familiar and previously trained using the teacher interaction observational grid. Inter and intra-rater agreements checks were conducted with 30% of the lessons. Intra-rater checks were conducted 2 weeks following the initial analysis, while inter-rater agreements were coded by an unaffiliated research student. Using the calculation $((\text{total agreements}/\text{total statements}) * 100)$, agreements were deemed appropriate as they were well above the 80% threshold (inter = 88%; intra = 95%).

Descriptive (Mean and Standard Deviations) and reliability (Cronbach) statistics were calculated on all dependent variables for both pretest and posttest scores within each treatment group. Cronbach analyses were deemed acceptable as they exceeded the .70 threshold identified by Nunnally (1978). Intraclass correlation coefficients (ICC) were conducted to examine whether the individual or group should be the unit of analysis. Both pretest and posttest ICCs provided negative results thus following the recommendations of Kenny and La Voie (1985) the individual was deemed the appropriate unit of analysis.

Changes in Instructional Autonomy-Support and Student Motivation

The primary research question examined whether exposure to an autonomy-supportive intervention would significantly change the autonomous instruction and perceptions of autonomy-support within physical education. Five separate (Group X Time) repeated measures ANOVAs for each dependent variable (i.e. autonomous-instruction, controlling-instruction, neutral-instruction, perceptions of autonomy-PT and perceptions of autonomy-Students) were calculated. Due to the use of multiple ANOVA calculations, a Bonferroni adjustment was calculated ($p < .01$).

A secondary research question examined the extent by which student motivation may have changed during the 4-week sport-based unit. As such, a (Group X Time) repeated measures ANOVA was calculated for student motivation.

Results

Descriptive statistics and reliability analysis are displayed in Table 2 for all dependent variables.

Measure	Treatment		Control			
	M	SD	M	SD		
<u>Observation of Instruction</u>						
Autonomous - Pre	12.52	8.45	12.65	8.88	.71	
Autonomous – Post	17.42	8.92	12.49	8.04	.75	
Controlling – Pre	35.11	19.20	37.56	17.33	.82	
Controlling – Post	32.88	17.06	38.00	16.66	.81	
Neutral – Pre	31.02	14.33	31.99	13.01	.79	
Neutral - Post	30.66	12.02	32.22	12.11	.73	
<u>Perceptions of Autonomy</u>						
PT – Pre	-0.21	2.65	-0.92	2.46	.89	
PT – Post	0.21	2.59	0.05	2.05	.91	
Student – Pre	4.03	0.77	4.25	0.79	.95	
Student - Post	4.78	1.22	4.35	1.11	.89	
<u>Student Motivation</u>						
Pretest	4.05	1.85	4.01	1.96	.92	
Posttest	4.20	1.88	4.05	1.85	.91	

Table 2. Descriptive statistics and reliability analysis

ANOVA calculations revealed a significant main and interaction effect for autonomous-instruction (Time) $F(1,26)=8.55$, $p<.01$, $\eta^2 = .240$, (Time X Treatment) $F(1,26)=7.77$, $p<.01$, $\eta^2 = .228$ with PTs exposed to the intervention demonstrating a higher frequency of autonomous interactions compared with those in the control group. In addition, students exposed to PTs engaged in the autonomy intervention perceived a significantly higher level of autonomy support (Time) $F(1,657)=529.26$, $p<.01$, $\eta^2 = .446$, (Time X Treatment) $F(1,657)=27.51$, $p<.01$, $\eta^2 = .040$, while results indicated a lack of significance for controlling-instruction (Time) $F(1,26)=2.00$, $p>.01$, $\eta^2 = .088$, (Time X Treatment) $F(1,26)=4.01$, $p>.01$, $\eta^2 = .151$, neutral-instruction (Time) $F(1,26)=.20$, $p>.01$, $\eta^2 = .008$, (Time X Treatment) $F(1,26)=2.06$, $p>.01$, $\eta^2 = .103$, PTs perception of autonomy-support (Time) $F(1,26)=1.21$, $p>.01$, $\eta^2 = .044$, (Time X Treatment) $F(1,26)=0.20$, $p>.01$, $\eta^2 = .008$ and student motivation (Time) $F(1,657)=.851$, $p>.05$, $\eta^2 = .001$, (Time X Treatment) $F(1,657)=3.29$, $p>.05$, $\eta^2 = .005$.

Discussion

The primary emphasis of this research was to examine the influence of an intervention on perceptions and implementation of autonomous instruction of PTs within physical education. Results indicated that PTs exposed to the intervention significantly changed their autonomous instruction compared with PTs within the control group, while there were no significant differences in the perceptions of being an autonomy-supportive teacher. In addition, students exposed to instruction by PTs within the treatment group significantly changed their perceptions of the social

context (i.e. more autonomous), while measures of student motivation were deemed insignificant.

Influence of the intervention brought about positive changes in observed instruction related to creating an autonomous social context, primarily focused on the increase in the number of autonomy-supportive student interactions. This finding supports and extends previous studies related to providing an autonomy-oriented intervention and the impact on teacher instruction (Reeve, 1998; Reeve et al., 2004; Tessier, et al, 2008; Tessier, et al, 2008). Within physical education, this finding illustrates how focusing PTs attention on specific instructional behaviors, espoused by SDT literature, can facilitate change in the delivery of instruction and students perceptions of an autonomy-supportive context. An important aspect of this study in terms of teacher preparation is the ability to translate theory into practice. As such, providing PTs with operationally defined instructional behaviors based on a theoretical framework (i.e. SDT) may have allowed for a deeper understanding of the 'how' and 'what' of an autonomy-supportive learning context.

There were a number of interesting findings, beyond the significant changes of the increase use of autonomy statements: (a) orthogonal aspect of the social context, (b) lack of change of student motivation and (c) difference between perception and observational data. First, the lack of significant change in the number of controlling and neutral statements supports the orthogonal claim of autonomy-supportive instruction (Barber, 1996; Grolnick, 2003; Silk, Morris, Kanya & Steinberg, 2003; Tessier, et al. 2008). Not only were the measures of control and neutral insignificant, mean scores seemed to stay the same while autonomy rose. While autonomy-support can be orthogonal, a plausible reason for the change in autonomy-supportive statements could be attributed to the intervention focus (e.g. primarily on providing autonomy-support, with limited focus on controlling statements). From a teacher education perspective, limiting PTs access to only elements of an autonomy-supportive context (e.g. omission of elements associated with a controlling environment) can be viewed as an initial step in developing a teachers' ability to provide a motivationally supportive setting.

Findings associated with the lack of significant changes in student motivation is contraindicated by previous intervention studies (Tessier, et al., 2010). A plausible reason for the lack of motivational change could be associated with limited time (i.e. 4-weeks) students were engaged in each unit of study. While student motivation is malleable, it is difficult to expect significant change from students who have developed their motivational profile during the previous 9-10 years of schooling. As such, it may seem logical to further student engagement within an autonomy-supportive context to examine the influence of such a context on motivation.

The differences between results of observed and perceptions of autonomy-support from the PTs are interesting. The aforementioned finding illustrates the continued need to examine teacher instruction using a combined perception and observation method to assist in alleviating the perception and implementation paradigm within teaching. At times, PTs may think (i.e. perceive) and act (i.e. delivery of instruction) in different ways. Collection of robust perception and observation data may act as a reflective tool illustrating the disconnect between what PTs thought about their teaching and actual practices.

Conclusion

The results of this study indicate that providing teachers with an intervention based on developing and implementing an autonomy-supportive teacher can contribute to the delivery of more motivationally supportive instruction. Developing future teachers may benefit from interventions that translate theories, such as SDT, that align with all aspects of life into useable frameworks for the enhancement of pedagogical practices within education. Autonomous instruction is multi-faceted and there are a number of specific behaviors that teachers can utilize in creating the educational environment. As such, it is imperative within future studies to understand which behaviors are utilized and why teachers may prioritize or utilize one behavior over another. It should be noted that this study is not without limitations. The use of an online intervention limited the ability to model autonomous behaviours (e.g. Language) and as such, this could be an avenue for future research. In addition, future studies may benefit from using a qualitative approach to gain insight into rich and robust data that goes beyond information gathered from surveys and observations, as well as providing a follow-up of each PT to investigate the lasting impact of the intervention.

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