TEACHER INSTRUCTIONAL PRACTICES AND STUDENT ACHIEVEMENT IN SCIENCE STREAMING CLASSES: THE CASE OF ISLAMIC RELIGIOUS SCHOOLS IN KELANTAN, MALAYSIA

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A project report submitted in partial fulfilment of the requirements for the award of the degree of Master of Education (Curriculum and Instruction)

Faculty of Education
Universiti Teknologi Malaysia

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Specially dedicated to my husband Nor Azri Othman, my daughter Nisreen Amaleen, my son Nabhan Affan and my Mak and Ayah and all my siblings.

Thank You.
ACKNOWLEDGEMENT

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ABSTRACT

As teachers are pressed to extend their craft to prepare more diverse students for the challenge of work and life beyond school, they are challenged to provide more authentic instructional contexts and activities. In order to be successful, teachers must be reflective and analytical about their own practices. Toward this end, the study investigated instructional practices (IP) of teachers in Islamic religious schools in Kelantan, Malaysia. The focus was on these teachers’ IP while teaching subjects of Biology, Chemistry and Physics in Science Streaming Classes. The four instructional practices measured are Inquiry-Discovery (ID), Constructivism, Science Technology and Society (STS) and Mastery Learning and the analysis of data indicate high mean score, i.e., ID (M = 3.75), Constructivism (M= 3.94), STS (M= 3.70) and mastery learning (M = 3.75). This means to prove all 18 teacher participants in the study adopt these IPs. The study also focused on students’ achievement factors in terms of Motivation and Self-regulated learning (SRL). 233 students responded to two instruments; Students’ Motivation Toward Science Learning (SMTSL) by Tuan et al. (2005) and SRL scale by the Paul R. P and Elisabeth V. D. G, (1990) which was modified accordingly. A moderate level of motivation (M=2.38) and moderate level of SSRL (M=2.49) was recorded among students. The study therefore concludes that the heavy subject load of integrating both Islamic Religious and Science streaming curriculums do not hinder teachers to adopt various IPs, or students from being motivated and self-regulate their learning.
ABSTRAK

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| SMU     | Religious Examination  
(Sijil Menengah Ugama) |
| SPM     | Sijil Peperiksaan Malaysia  
(Malaysia Certificate of Education) |
| SRL     | Self-regulating Learning |
| SRU     | Self Regulatory Strategy Use |
| STMSL   | Students’ Motivation toward Science Learning |
| STS     | Science Technology and Society |
| STAM    | Malaysian Higher Islamic Religious Certificate  
(Sijil Tinggi Agama Malaysia) |
| STPM    | Malaysian Higher School Certificate  
(Sijil Tinggi Persekolahan Malaysia) |
| YIK     | Kelantan Islamic Foundation  
(Yayasan Islam Kelantan) |
| YPINK   | Yayasan Pelajaran Islam Negeri Kelantan |
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CHAPTER 1

INTRODUCTION

1.1 Introduction

In the year 2020, Malaysia is aiming to become a fully industrialised and developed country as envisaged in the nation's 'Vision 2020.' In the effort, currently Malaysia is focusing on the provision of a good education and effective learning and teaching strategies than before. For certain, this includes a good science education as science is considered as a key growth area for the Malaysian economy. In line with this, various new measures are being taken to develop and innovate the science curriculum in schools. The recent Malaysia Education Blueprint 2013-2015 (2012), (hence forth referred as ‘the Education Blueprint 2013’), for example, lays out various long-term policy directions to achieve rapid, sustainable and fundamental transformation of the Malaysian education system.

Historically, the modern education system in Malaysia has being emphasising the development of strong content knowledge in key subjects including science. Beside this, the Education Blueprint 2013’ calls for a refocus on developing higher-order thinking skills. This is in line with the concerns over risks and decline in
standards with regards to ‘a variety of scientific cognitive skills such as application and reasoning’ (The Education Blueprint 2013, p. E5).

The Education Blueprint 2013, hence, suggests various policy guidelines for religious, sports, arts, and other educational pathways in the country. It is in this context, the present study aims to address the instructional practices and student achievement among the Malaysian Religious schools. The study focuses on impact of instructional practices adopted by such schools in providing the learning of science stream subjects. The study specifically focuses on such religious schools in Kelantan. The following section on the background of the study further elaborates on these schools, their curriculum for teaching religious and sciences stream subjects.

1.2 Background of the Study

Religious schools are the earliest forms of schooling known in Malaysia. In the past, mostly they offered non-formal education through Qur’anic schools, then in schools known as Sekolah Pondok and then in Madrasah. This pattern of education concerned mostly on Islam and the Holy Quran, provided a non-systematic education, with no written curriculum, fixed schedule and teaching aid (Fakhrurrazi A.M, 1998). As Rosnani Hashim et.al.(2011) stated Kelantan and Terengganu could be considered as pioneers of Pondok education. The first pondok in Kelantan was Pondok Tok Pulai Chondong, establish in 1820 (Rosnani, 2004, p. 24). In 1962, there were over 100 Pondoks in the then Kelantan District (Yayasan Islam Kelantan, 1995/1996).

The more organized forms of religious schools known as madrasah was established since the twentieth century (Rosnani et.al . 2011). The first Madrasah or
Arabic school named as Madrasah Muhammadiyah was founded by the Council of Malay Kelantan Custom and Islamic Religion (Majlis Agama Islam dan Istiadat Melayu Kelantan, MAIK) in 1915 (Fakhrurrazi A.M, 1998). This Madrasah or Arabic school had three streams: Malay and English stream in 1917 and Arabic stream in 1924 (Kam Kim, 1994). This school initially received less support from people because of the high influence of Pondok in that time. In 1920s, some branches of these schools, including schools for girls were established (Nik Mohamed N.M.S, 1988).

Later on, Madrasahs was turned into Rakyat (Arabic) Secondary School (Sekolah Menengah (Arab) Rakyat). The Rakyat (Arabic) Secondary School (Sekolah Menengah (Arab) Rakyat) were constructed by certain individuals or by local residents in the village, mostly through charitable donations and school fees. They were established due to the inability of MAIK to provide sufficient religious schools in the state Kelantan. However in terms of registration and the curriculum, they were under MAIK supervision as it was the highest body (Abdul Razak M. 2002. P. 125).

In 1976, all schools under MAIK were taken over by the State Government through Department of Religious Schools in Kelantan (Jabatan Sekolah-sekolah Agama Kelantan, JASA). In 1979, they were re-registered under Kelantan’s Education Foundation (Yayasan Pelajaran Islam Negeri Kelantan or YPINK) through the Kelantan Enactment bill 5/1979. To give more power to the Foundation, the modified of enactment in 8/1982 was done. Thus, YPINK was changed into Kelantan Islamic Foundation (Yayasan Islam Kelantan or YIK). Accordingly to Fakhrurrazi A.M (1998) this modification also was due the financial constraints. YIK was established to strengthen the management and control of schools, religious or Arabic.

Currently, YIK administration has a total of 18 secondary schools fully registered under the State, 45 state assisted religious schools, 20 schools under Government Aided Religious Schools (Sekolah Agama Bantuan Kerajaan or SABK), 5 Madah Tahfiz, a Pondok, an Islamic Foundation College, and 3 Islamic Kindergarten located in various locations in 10 territories around the Kelantan state (Pelan Startegik YIK 2010-2015, 2010 pp 32). All school under YIK administration
(either registered fully under the State or assisted religious schools, SABK and Maahad Tahfiz) used its own curriculum, and kept a separate identity from those of the National Secondary Religious Schools (Sekolah Menengah Kebangsaan Agama or SMKA), which was introduced by the Ministry of Education in 1977 to offer Arabic language and higher Islamic religious study for all its students beginning with the first year of secondary school (Rosnani, 2004, p. 9).

By establishing the SMKA, the MOE aimed to make students of SMKA to ‘penetrate various professions, but with their Islamic values intact’ (Rosnani, 2004, p. 86). In 1989, following the formulation of the National Education Philosophy (NEP), the Integrated Curriculum for Secondary Schools (Kurikulum Bersepadu Sekolah Menengah or KBSM) was introduced to the SMKA.

In the beginning there were only eleven SMKAs. One of the first schools of Rakyat Religious Schools (Sekolah Agama Rakyat or SAR) in Kelantan involved in this program was SMKA Naim Lilbanat. Thus, in the SMKA students are taught not exclusively in the religious subjects but also in one of three available streams: arts, science, and technical/vocational. Currently, there are about 55 schools of this type in Malaysia and six of them are in Kelantan (MOE, 2013). Currently, the MOE is exploring opportunities to increase the number of religious schools available to students. This could include attempts to increase the number of SMKAs and encouraging greater conversion of private religious schools to SABKs (Blueprint, 2012, p. 7/12). More and more parents are interested in sending their children to SMKA, as demonstrated by the fact that it is one of the fastest growing schooling options in Malaysian education. However, 50% of applications are rejected due to limited places (Blueprint, 2012, p. 7/10). Thus, besides SMKA, there are other religious school pathways that ‘may fall under the jurisdiction of either the federal or state governments’ (Blueprint, 2012, p. 7).

To put this long narration in short, the contemporary religious schools in Malaysia can be grouped into five types, i.e., National Religious Schools, (Sekolah Menengah Kebangsaan Agama or SMKA), Government Aided Religious Schools (Sekolah Agama Bantuan Kerajaan or SABK), State Religious Schools (Sekolah
Agama Negeri or SAN), Rakyat Religious Schools (Sekolah Agama Rakyat or SAR) and Private Religious schools (Sekolah Agama Swasta (SAS) (Table 1.1).

Table 1.1: Option of religious schools in Malaysia

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At present, the MOE supports many of the schools identified with the federal government through financial, administrative and infrastructural supports to religious schools, but not pertaining to curricular content, although the MOE was keen to continue improving the international recognition of the religious education qualifications in Malaysia. The criticism goes that various core religious subjects introduced by the MOE namely the Al-Quran and Al-Sunnah, Syariah Islamiyah Education, Tasawwur Islam and Higher Arabic language do not come at par with the the Al-Azhar secondary curriculum. Rather they are taught in Malay than Arabic medium. Then, only about 30% of class teaching time is allocated to religious curriculum compared to 60% to 70% which was the case before KBSM was introduced (Azizi U. et al., 2011). This remains as the reason why many Rakyat (people) Religious Schools (Sekolah Agama Rakyat or SAR) authority was not confident of the MOE (Azizi U. et al., 2011).
SAR reflects Malaysia’s long tradition of formal form of religious education established and managed by individuals or a group of local residents in villages, independent Islamic foundations, or other nongovernmental organizations. This adds to highly diverse curriculum followed by them. However, mostly they follow closely the curriculum set by the state religious departments for state religious schools, but not the national curriculum or any other formal Islamic studies curricula made available through government agencies (Raince, 2009; Rosnani, 2004, p. 132). Thus, they maintain their autonomy over educational issues and have tended to resist state and national government intervention which seeking religious schools to move forward in line with other schools (Raince, 2009). However, due to the government policy requiring students from secondary religious schools to sit for public examinations the scope of vocation expanded and the vocational aim grew in importance that from 1995 onwards many of SAR also offer the science streaming classes.

The case of Government Aided Religious Schools (Sekolah Agama Bantuan Kerajaan or SABK) is particularly relevant at this point. The MOE introduced Government Aided Religious Schools (Sekolah Agama Bantuan Kerajaan or SABK) in 2005 based on the recommendations Tan Sri Murad report on reviewing Islamic Education issues and role of Islamic religious schools (Azizi U and H. Hanafi Atan, 2012). SABK schools are registered with and administered by the Ministry of Education, which entitle them to get various supports and facilities from the ministry. They are considered as public schools which include primary and secondary schools which formerly were SAR and had agreed to receive government assistance in return for converting to the government curriculum. Key difference between SABK and the SMKA is that religious subjects in curriculum in SABK are taught in Arabic (Blueprint 2012, Exhibit 7/8). Similarly with SMKA, they also follow the Integrated Curriculum for Secondary Schools (Kurikulum Bersepadu Sekolah Menengah or KBSM). According to MOE till Jun 2012, there are about 169 out of 384 religious schools had been registered under SABK and 21 of them are in Kelantan.
One of the similarities between SABK and SAR in Kelantan is their practice of two groups of subjects or two curriculums; a religious curriculum and National Curriculum, i.e., KBSM. The religious curriculum in SAR is based on the model of the Maahad Al- Bu'uth Al-Islamiah al-Azhar, which includes subjects on Islamic studies, Arabic language and literature, and they are taught in the Arabic medium. SABK, meanwhile, follow a curriculum prepared by the state and the subjects are taught in Bahasa Malayu. Once students complete Form 2 under this curriculum, they would sit for the Lower Secondary Religious Examination (Penilaian Menengah Rendah Ugama or PMRU). Once qualified they can further their study under the same curriculum till Form 4, upon which sit for Secondary Religious Examination (Sijil Menengah Ugama or SMU) (Nik Kamliah N.A (2006).

In Kelantan, the Kelantan Islamic Foundation (Yayasan Islam Kelantan or YIK) is responsible for the dissemination and development of Islamic education in the state. The foundation maintains the autonomy of the schools under it. Thus, many SAR under YIK did not convert to the group of SMKA. However, it manages few SABKs, but are aided by the goverment. As per a Memorandum of Understanding (MoU) signed by state with MOE, these SABK follow the state religious curriculum, which is not the case in many other states. Similarly with SAR, they teach two-pronged curriculums simultaneously: a religious curriculum in line with the Al-Azhar secondary curriculum, and a National curriculum in line with the Ministry of Education (MOE). In line with MOE, they follow the Integrated Curriculum for Secondary Schools (Kurikulum Bersepadu Sekolah Menengah or KBSM) and students are taught in one of three available streams: arts, science, and technical/vocational.

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To put it differently, the implementation of two curriculums means more subjects need to be learned by students; class learning time to be shortened so that all subjects in both curriculums are taught effectively, but consequently reducing student-teacher interaction and utilization effective teaching and instructional methods. This study aims to explore effects of following such two heavy curriculums on student achievement in science stream subjects, i.e., Biology, Physics and Chemistry. Also the study aims to find out the patterns of instructional practice of teachers teaching these subjects. The study therefore does not involve discussion on policy and administrative issues, whereas the above background was given to put the study in a context.

1.3 Statement of Problems

In the debate on what factors cause students to achieve in their study, many factors have been identified to contribute to different aspect of their academic achievement. Academic achievement is defined by Crow and Crow (1969) as the extent to which a learner is profiting from instruction in a given area of learning. In other words, achievement is reflected by the extent to which skill and knowledge has been imparted to pupils. Academic achievement also denotes the knowledge attained and skill developed in the school subject, usually designed by test scores. The level of achieving is how far students succeed in a particular exam or standardized test (Reber, 1985).

The factors that lead to academic achievement include factors include the students’ background and general social context or parents’ socio-economic status (Anisef and Bunch, 1994; Cassidy and Lynn, 1991), parenting styles (Darling and
Steinberg, 1993; Steinberg, 1996; Nooraini and Azizi, 2004), parental expectations and involvement such as amount of time that parent spent with children (Muola, 2010), teachers’ expectancies (Haynes and Johnson, 1983), class size (Mosteller, 1995), teacher qualifications (Ferguson, 1991), school size (Haller, 1993), school climate, teaching and learning or instructional practices by teachers and peer relationship (Adeyemo and Torubeli, 2008; Berndt et al., 1990; Levitt et al., 1994). Other things that may influence academic achievement include student motivation (Nunez et al., 1998) and self-regulated learning or SLR (Pintrich & de Groot, 1990; Zimmerman & Martinez-Pons, 1990).

Ryan S.J.D. Baker and Philip H. Winne (2013) suggested how motivation together with metacognition and self-regulated learning offers significant affordances to learning science. The three together provide raison d’être about why and how learners develop knowledge, beliefs, attitudes and interests. Motivation is considered in relation to the object of motivation, and the behaviours that may be engaged in. In the context of learning, theories of motivation strive to account for why people initiate thoughts and why pupils continue to behave in a particular way.

Steffen (2006) suggested that self-regulated learning has become an important topic in educational and psychological research. Self-regulated Learning is the ability of students to plan, monitor, and evaluate their own behaviour, cognition and learning strategies McCaslin & Hickey (2001) and to have the ability to self-regulate, students must also be motivated to use developed or newly acquired self-regulation strategies effectively.

Thus, now days, in the face of globalisation and ever increasing influence of various technologies and global competition, the emphasis of education is no longer just on the transfer of content knowledge, but on developing instructional strategies that promote motivation and self-regulated learning among students. Stake and Easley (1978) found that many teachers emphasize facts in science contents and provide students with few opportunities to develop high level cognitive skills. Thus, in teaching, teachers not only must be knowledgeable of the content but be able to deliver them rightly to promote learning among students. This is extremely important, especially for secondary schools students because their achievement can
be related to their choices of subject and scholarship at the university level or their choices of future professions. Good academic results will provide more career choices and job security (Kong B. L., 2011).

A lot of instructional practices such as cooperative, collaborative, contextual and mastery learning, etc. have been already identified as very effective measures that inculcate motivation, metacognitive development and self-regulated learning. Adopting such practices would enhance an environment in which learners can acquire ideas, skills, and positive attitudes towards various subjects that they learn. This study concerns on how such practices are utilized in science-stream classes in secondary schools in Malaysia. This is done in the context of the report from Trends in International Mathematics and Science Study (TIMSS) that shows that students in Malaysia although they understand basic Mathematics and Science concepts, generally struggled to apply this knowledge. A breakdown of student performance in the most recent TIMSS 2007 results in comparison to other systems shows that relatively few of Malaysia’s students are excelling. Only 2-3% of Malaysian students perform at the highest benchmark level, such as complex problem-solving, whereas in comparison, more than 30% of students in Singapore scored at the advanced level in Mathematics and Science (Blueprint MOE, 2012 p. 3/10).

Further this study is carried out in the specific context of SABK and SAR, where compared to the national type schools or SMKA students need to learn more subjects for they implement two curriculums. That means they have shortened class learning time consequently resulting in the reduced student-teacher interaction and less utilization of effective teaching and instructional methods. For example, in SABK and SAR schools, students need to learn twenty three subjects meanwhile in the national type schools then need study only ten subjects. In the context of this increased number subject matter, this study investigates how students adapt with the situation. Specifically the study is interested to find out firstly, how students maintain their achievement in the science-stream subjects, how motivated these students are learn them, and how they self-regulated their learning; and secondly how they are correlated to the instructional practices adopted by the their teachers.
1.4 **Objective of the Study**

Objectives of this study are:

i. To identify instructions practices (IP) of teaching Biology, Physics and Chemistry subjects in science streaming class in Religious Schools in Kelantan.

ii. To identify the effects of these IP on the achievement of students in science streaming class in Religious Schools in Kelantan.

1.5 **Research Questions**

In this study, three questions will be addressed:

i. What are the common instructional practices (IP) adopted by teachers of Religious Schools in Kelantan while teaching science subjects in science stream classes?

ii. What are the effect of IP on student achievement, in terms of motivation and self-regulated learning in science subjects in science stream classes in Religious Schools in Kelantan?
1.6 Significance of the Study

Not many studies were done on the aspects of the instructional practices in the Malaysian context either in the context of science subjects matter or focusing on the Islamic religious schools. The Islamic religious schools represent only 4% of total amount of secondary schools in Malaysia. And what is studied about them mainly is on teacher instructional practices of subject such as Bahasa Melayu, English, Advanced Arabic and Qur’an and as-Sunnah from the perspective of teachers and students. Practices in science instruction as in these types of schools were not much discussed, may be because instructional practices in science should be following an approach are different from any other subjects. According to CBC (2005), teaching and learning strategies in the Biology, Physics and Chemistry should emphasise thoughtful learning. Thoughtful learning is a process that helps students acquire knowledge and master skills that will help them develop their minds to the optimum level. Thoughtful learning can occur through various learning approaches such as inquiry-discovery, constructivism, contextual learning, and mastery learning. In this regard, as Nurfaradilla et al (2010) reveal, uncovering problems faced by science teacher and discussing the gaps between theories of teaching and teaching practice is very much significant. It is hoped that this research will help find out details on any gaps in sciences instructional and teaching practices among the religious schools in Malaysia. Adoption of suitable instructional practices will help to increase student achievement. Thus, the study also will look on the relation between student achievement and teacher instructional practices. The finding of this study will help teachers to get better insights on what instructional practice should be continuously used to help students, and thereby teachers could modify their practices of teaching science and improve the quality in education.
1.7 **Scope of the Study**

This research concerns to collect the data on Instructional Practice Patterns among teachers of Biology, Chemistry and Physics in Science Streaming Classes in SABK and SAR. There are several schools that offer Science Streaming Class in SABK and SAR but only a few of them were chosen. These schools select student to place them in science stream according to their respective result in Lower Secondary Assessment (Penilaian Menengah Rendah (PMR). They are: SMU (A) Maahad Muhammadi Lelaki, SMU (A) Maahad Pengajian Islam, SMU (A) Maahad Muhammadi Pasir Mas and SMA Tengku Amalin Aishah and SMU (A) Maahad Amir Petra. Details on these schools will be discuss in Chapter 2.

1.8 **Limitation of the Study**

Limitations of the present study are:

a) This study is only limited to Instructional Practice Patterns (IPP) such as Inquiry Discovery, Mastery Learning, Constructivism, Science Technology and Society (STS) in science learning.

b) Student achievement in this study only concern on motivation and Self-Regulated Learning.

c) The study is limited to Form 5 students of religious schools in Kelantan which cover SABK and SAR who study in science streaming classes.

d) In this study, only the science teachers of certain religious schools in Kelantan that have science streaming classes are included as participants.
1.9 Operational Definition of Terms

**Students**
Student in this study are secondary school learners enrolled in Form 5 science streaming classes in religious schools in Kelantan.

**Teachers**
In this study, the term teacher is used to refer to those who instruct and teach Biology, Chemistry and Physics subjects in in Form 5 science streaming classes in religious schools in Kelantan.

**Instructional Practices (IP)**
In this study, Instructional Practices (IPP) is defined as the general principle, guidelines and suggestions for the systematic of instruction based on the Inquiry-discovery, constructivism, Mastery learning and Science-Technology Society (STS),

**Inquiry-Discovery**
Inquiry-discovery emphasises learning through experiences. Inquiry generally means to find information, to question and to investigate a phenomenon that occurs in the environment. Discovery is the main characteristic of inquiry. Learning through discovery occurs when the main concepts and principles of science are investigated and discovered by students themselves (CBC, 2005)

**Constructivism**
Constructivism suggests that students learn about something when they construct their own understanding. The important attributes of constructivism are as follows: i.e.: taking into account students’ prior knowledge, learning occurring as a result of students’ own effort, learning occurring when students restructure their, existing ideas by relating new ideas to old ones, providing opportunities to cooperate, sharing ideas and experiences, and reflecting on their learning. (CBC, 2005)
Mastery Learning
Mastery learning is an approach that ensures all students are able to acquire and master the intended learning objectives. This approach is based on the principle that students are able to learn if they are given adequate opportunities, to learn at their own pace, with the incorporation of remedial and enrichment activities as part of the teaching learning process (CBC, 2005)

Science, Technology and Society (STS)
STS approach suggests that science learning should take place through investigation and discussion based on science and technology issues in society. In the STS approach, knowledge in science and technology is to be learned with the application of the principles of science and technology and their impact on society. (CBC, 2005)

Achievement
A student’s current level of achievement is at a standard above their year group, which means that special consideration needs to be given to their learning needs in order to provide them with sufficient challenge to continue their accelerated rate of progression into the future.

Motivation
Theories of how students initiate behaviour, including thoughts, and why they continue to behave in a particular way or they change behaviour. Implicit in this view of motivation are six key features self efficacy, active learning strategies, science learning value, performance goal, achievement goal, learning environment stimulation.

Self-Regulated Learning (SRL)
SRL is an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their motivation, cognition, and
behavior, guided and constrained by their goals and contextual features of the environment. Implicit in view of SRL are two major strategy; cognitive strategies use (students use to remember, and understand the material) and self regulatory strategies (planning, monitoring, and regulation, students' management and control of their effort on classroom academic material (Pintrich, 1990).
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