



# Informed Teachers and Learners: the importance of assessing the characteristics needed for lifelong learning

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**ABSTRACT** *In order to be members of the learning society, students must become lifelong learners; that is, learners who have a wide repertoire of cognitive learning strategies, are metacognitive about learning and themselves as learners, are motivated to learn, and can manage their feelings and available resources effectively. Although there is evidence that these lifelong learner characteristics contribute to academic achievement, not many teachers or students know much about them or their relationship to learning and assessment. In this paper, we describe how cognitive, metacognitive, motivational and affective aspects of learning can be assessed using both quantitative and qualitative methods and discuss how the outcomes of this assessment can inform learning, teaching and assessment practices that foster lifelong learning.*

## **Introduction**

It is now well accepted that, in order to survive and prosper socially, politically and economically, we must build a learning society based on a culture of lifelong learning in which “everyone should be able, motivated and actively encouraged to learn throughout life” (McKenzie & Wurzburg, 1997, p. 13). Lifelong learning can be defined as:

... the development of human potential through a continuously supportive process which stimulates and empowers individuals to acquire all the knowledge, values, skills and understanding they will require throughout their lifetime and to apply them with confidence, creativity and enjoyment in all roles, circumstances and environments (Peck, 1996, p. 645).

Moreover, it is now possible to create a learning society since, as Bentley (1998, p. IV) points out in a Special Supplement on lifelong learning in the New Statesman, “[f]or perhaps the first time in modern history, the prospect of a society in which every person can be educated to the level of achievement of which they are truly capable is real”. Below, we describe the characteristics of successful lifelong learners and how these can be developed as part of university study. We then outline the rationale for assessing lifelong learning characteristics, describe how these can be assessed and discuss the value of assessing them for both teachers and learners.

## Characteristics of Successful Lifelong Learners

University students, if they are to become part of and contribute to the new learning society, should, as an outcome of their learning experiences, become lifelong learners (Candy *et al.*, 1994; McInnis *et al.*, 1995). Students need to possess a number of characteristics in order to be lifelong learners. These include, among others, self-knowledge, self-confidence, persistence and a positive view of the value of learning. Students also need good self-management skills, including the ability to be well organised, manage time and effort effectively, know when and how to seek help, and how to collaborate with peers (Pintrich *et al.*, 1991; Zimmerman, 1986, 1994). They need to be motivated to learn, to have positive feelings about themselves as learners and about learning, to be able to manage their feelings and the highs and lows of study (Boekaerts, 1993; McCombs & Whistler, 1989; Pintrich & Schrauben, 1992). Students also need a well developed set of learning strategies and the metacognitive skills to reflect on and regulate their learning (Paris & Winograd, 1990; Weinstein, 1987; Zimmerman & Martinez-Pons, 1992).

The characteristics needed for lifelong learning are also those that are needed for effective learning at university. The literature suggests that university students, to be effective learners, need to have a well developed set of cognitive learning strategies such as memorising, note-making, summarising, identifying main ideas and categorising information, and be able to match these to learning tasks. They also need to be metacognitive, that is, know about and be able to control their learning and themselves as learners. Effective learners know how, when, where, and why they learn best and what constitutes good learning outcomes in a range of situations. They are also able to control their learning by planning, monitoring, evaluating and adapting their learning. Students also need to be motivated to learn by having a positive attitude towards learning, confidence in themselves as learners and high expectations that they will be successful. Finally, effective learners have positive feelings about learning tasks and themselves as learners and are able to manage negative feelings effectively (Biggs & Moore, 1993; Janssen, 1996; McKeachie *et al.*, 1986, 1987).

Thus, cognitive, metacognitive, motivational and affective characteristics are recognised as playing an important part in lifelong learning and effective university study. Students must, therefore, possess both *skill* and *will* if they are to be effective lifelong learners (Paris & Winograd, 1990; Pintrich, 1988; Pintrich & De Groot, 1990). There is evidence that the characteristics of effective learning are associated with academic achievement. Research suggests that using good study habits, possessing a repertoire of cognitive learning strategies and being metacognitive about learning are associated with higher academic achievement (Dart & Clarke, 1991; Pintrich & Johnson, 1990; Nist *et al.*, 1991; Volet, 1991; Westman & Lewandowski, 1991).

Student motivational orientations are also linked to academic achievement (Ames & Archer, 1988; Dweck, 1986). For example, Pintrich *et al.* (1993) found that students who approached their work with an intrinsic goal for learning, who believed that the material was interesting and important, who had high self-efficacy beliefs

for accomplishing tasks, and who rated themselves as in control of their learning, were more likely to do well in terms of their grades.

Finally, research suggests that affective characteristics are linked to academic achievement. For example, students who report being anxious about tests are less likely to do well in a course (Biggs & Moore, 1993; Pintrich *et al.*, 1993; Tobias, 1985). Indeed, research consistently supports the strong negative correlation between anxiety and achievement (Woolfolk, 1995).

### **Developing Lifelong Learning Characteristics**

Universities have recognised the critical importance of developing lifelong learning as an outcome of a university education (Crebert, 1994). Most descriptions of the attributes of graduates identify characteristics of lifelong learning and course goals often include these. Many graduates, however, appear to leave university without these important characteristics as attested by feedback from employers, professional bodies and graduates themselves (ACNielsen Research Services, 2000; Harvey, 1993; Johnson, 1998). Further, there is evidence that most students entering university need help to develop the characteristics outlined above in order to be effective lifelong learners (McInnis *et al.*, 1995). Indeed, McKeachie *et al.* (1986, p. 1) state that:

... every course should help students become aware of strategies for learning and problem solving. An explicit goal of education throughout the curriculum should be to facilitate the development both of learning strategies and problem solving skills and of effective strategies for their use.

In terms of developing lifelong learning characteristics, the current consensus is that these are best taught as part of regular courses by the subject teacher with special attention being paid to the teaching-learning context, particularly the role of assessment. In other words, a focus on developing lifelong learning characteristics should form part of the learning objectives, teaching and learning activities and assessment tasks of every course. In particular, Boulton-Lewis *et al.* (1996, p. 106) suggest that courses include:

... situations that require students to increasingly take control of their own learning including reading, summarising, presenting and discussing material with peers, deciding what they want and need to learn, and then taking responsibility for searching the literature themselves. It would appear also that they need help in structuring the content of their learning ... It would also be important to make students aware that they were to be assessed on the level of structure of their work, as well as the content.

Moreover, as already mentioned, attention should be paid to what aspects of learning are being assessed since, as Ramsden (1992) among many others, has pointed out, it is assessment that actually drives the curriculum.

### Rationale for Assessing Lifelong Learning Characteristics

Assessment plays a critical role in what is learned and taught and how it is learned and taught. Both students and teachers often pay attention to those aspects of learning which are assessed and may ignore those that are not, irrespective of the stated learning objectives. Moreover, what students see as the purpose of an assessment task will affect how they go about learning (Biggs, 1995).

Meaningful assessment, according to Johnson and Johnson (cited by Smith, 1998) includes three aspects. First, meaningful assessment has a significant purpose such as feedback on "... both the process students are using to learn and the quality and quantity of their learning" (Smith, 1998, p. 65). Second, it involves students in the assessment process. Third, it focuses on future learning in terms of students planning and monitoring their learning goals and having positive feelings about their learning.

Much assessment, however, is used in ways which fail to provide appropriate feedback about important aspects of learning, allow only minimal student involvement in the process, and contribute little to the development of students as effective lifelong learners. Moreover, traditionally assessment has focused more on the content than on the process of learning (Anderson, 1998). In the traditional teacher-centred, content-focused transmission model of teaching and learning found in many university classrooms, assessment focuses on the "... products of learning" rather on the "... how and why of student learning" (Anderson, 1998, p. 8). This traditional view of teaching and learning is summarised in Fig 1.

One consequence of this traditional approach to teaching and learning that emphasises subject content rather than the learning process, is that both students

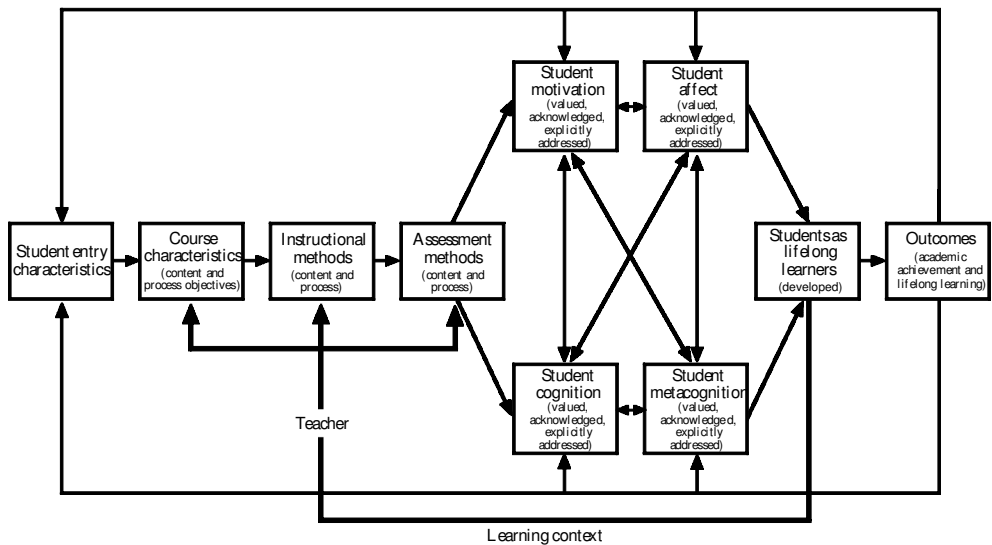


FIG. 1. Traditional model of teaching and learning based on the General Model of College Teaching and Learning (McKeachie *et al.*, 1986).

and teachers may have little knowledge about the role of student cognition, metacognition, motivation and affect in learning or to their full impact on learning outcomes. As Cross (1998, p. 7) reminds us:

... [w]e don't pay a lot of attention right now to giving students feedback on their progress as learners. Mostly, students get grades that tell them how they have done relative to their classmates. That information is not useful feedback on their progress as learners, nor does it do anything to help students develop skills for self-assessment.

Moreover, teachers rarely get feedback about how their teaching may be affecting student cognition, metacognition, motivation and affect. When teachers seek feedback from students about the quality of their educational experiences, the strategies they use tend to focus on getting feedback on a narrow range of teaching activities such as lecturing performance, rather than on how students are learning (Powney & Hall, 1998). Teachers rarely ask students to give them feedback on their progress as learners or about whether and how they are becoming effective lifelong learners. Further, teachers often appear to ignore ways in which they could help their students to develop effective lifelong learning characteristics and do not explicitly teach or assess these aspects of learning. This is not surprising given that university teachers are normally appointed on the basis of their content expertise rather than on their knowledge of teaching and learning. As Sutherland (1996, p. 91) points out:

... [t]he reasons that faculty find it difficult to assess non content outcomes are the same as the reasons they find it difficult to consider using new teaching approaches. Faculty are experts in their field of study. They have spent their professional lives developing skill and confidence in their abilities as chemists, sociologists, rhetoricians, and art historians. Their training and focus has been on content, and few have been supervised or mentored in teaching and evaluating students.

Thus, neither students nor teachers may be aware of the full impact which cognitive, metacognitive, motivational and affective characteristics may have on student lifelong learning or how these may change as students progress through their course of study. Nor, without appropriate assessment of these characteristics, can students or teachers make informed decisions about the way they learn and teach. However, as Cross (1998, p. 7) argues, “[i]f the improvement of learning is the priority for the twenty-first century, teachers and students need to be able to use the results of their assessment to improve their own performance”. This is unlikely to happen unless students and teachers have information not only about students’ content knowledge but also about how they are developing as lifelong learners in terms of cognition, metacognition, motivation and affect.

Since both academic achievement and lifelong learning are important outcomes of university study, it would help teachers to know about current research on teaching and student learning. An understanding of learning can make a difference to the ways in which they think about their course objectives and teaching and assessment methods.

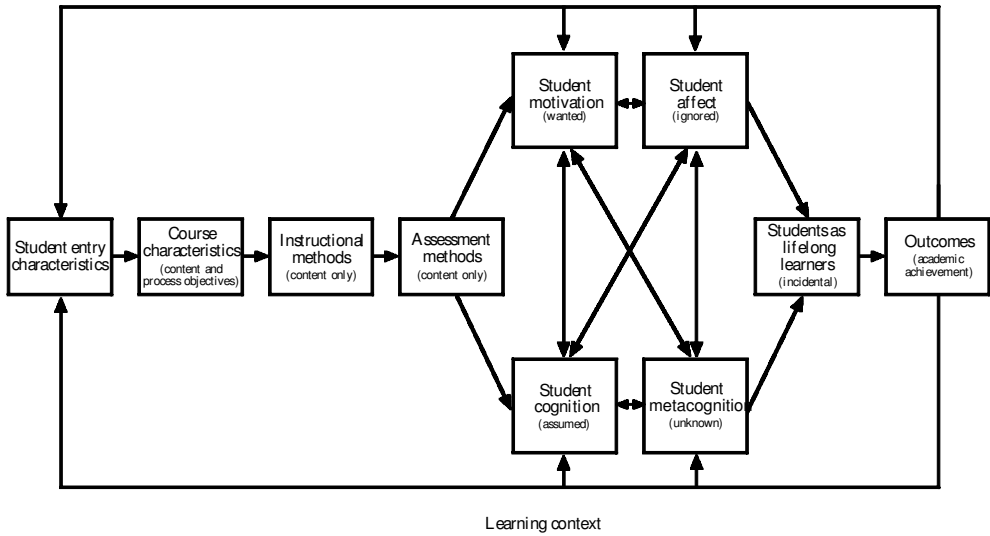


FIG. 2. Expanded model of teaching and learning (de la Harpe, 1998) based on the Model of College Teaching and Learning (McKeachie *et al.*, 1986).

In light of the above, it is clear that the traditional approach to teaching and learning needs to be expanded to include a focus on cognition, metacognition, motivation and affect in addition to the current focus on content knowledge. An expanded model of teaching and learning which reflects this view is presented in Fig 2.

As shown in the expanded model, the link is highlighted between obtaining information about lifelong learning characteristics and course planning and instructional and assessment methods. Also, the Instructional and Assessment Methods domains have been further expanded to include a focus on both content and process objectives, the Outcomes domain has been expanded to include a focus not only on student achievement but also on lifelong learning characteristics such as students’ use of cognitive and metacognitive learning strategies, their motivational orientations and their affective reactions. Finally, the Cognition, Metacognition, Motivation and Affect domains are modified to reflect the importance of valuing, acknowledging and explicitly addressing them in both teaching and assessment practices. In the next section, we outline ways of assessing the characteristics of lifelong learners in terms of cognition, metacognition, motivation and affect.

**Assessing Lifelong Learning Characteristics**

Teachers can, as part of their normal subject teaching, assess their students’ cognitive, metacognitive, motivational and affective characteristics in a number of ways. A selection of methods they can use are described below. These are presented in terms of the characteristics they assess.

Student cognition, metacognition, motivation and affect can be assessed using questionnaires such as the Learning and Study Strategies Inventory (LASSI) and the Motivated Strategies for Learning Questionnaire (MSLQ).

The LASSI, developed by Weinstein and her colleagues (Weinstein *et al.*, 1988), is a 77 item Likert-type self-report instrument consisting of ten scales—five on motivation and self-management and five on cognitive strategies. It takes about 15 minutes to complete and can be self-scored by students. The LASSI has been extensively and successfully used worldwide (Gilles, 1994; Pintrich & Johnson, 1990). It is available commercially in hard copy and online.

The MSLQ, developed by Pintrich *et al.* (1991), is a standardised 81 item Likert-type self-report instrument consisting of two sections—Motivation and Learning Strategies. The Motivation section is made up of three scales namely, value, expectancy and affective components. The Learning Strategies section is also made up of three scales namely, cognitive, metacognitive, and resource management. The MSLQ is designed to be modular and takes approximately 20–30 minutes to complete. It is a useful, reliable and valid means for measuring students' motivational orientations, and use of learning strategies (Gilles, 1994; Pintrich *et al.*, 1993).

In addition to the assessment methods described above which focus on all four aspects of lifelong learning, there are other methods which focus on one or more of these aspects. Each of the four aspects can be assessed individually or in combination using teacher-constructed assessment techniques such as Classroom Assessment Techniques (CATs). CATs have been developed and used by many classroom teachers to get feedback about various aspects of their students' learning. Fifty CATs are described in *Classroom assessment techniques* (Angelo & Cross, 1993). The book aims to "... provide college teachers—from various disciplinary specialties and backgrounds—with a compendium of good ideas developed by their colleagues for assessing and improving student learning" (p. 105). A number of the CATs included in the book focus on assessing students' course-related learning and study skills, their self-awareness as learners and their awareness of their attitudes and values.

Student cognitive and metacognitive characteristics can be assessed using interviews such as the Self-Regulated Learning Interview Schedule (SRLIS) and writing activities such as learning logs and statements about beliefs about learning.

The SRLIS, developed by Zimmerman and Martinez-Pons (1986), is a structured interview schedule asking respondents to describe the strategies they use in a number of learning contexts such as preparing for a test or completing a writing assignment. The authors report that data obtained using the SRLIS correlate well with academic performance and that the interview procedure provides reliable evidence concerning students' use of cognitive strategies and self-regulation of learning. In addition, it has potential for describing individual differences in student self-regulated learning. Learning logs have been used by Dart and Clarke (1991) and Alderman *et al.* (1993) to foster and assess students' cognitive and metacognitive strategy use. For example, Alderman *et al.* (1993) asked students to keep learning logs in which they wrote, on a weekly basis, descriptions of and reflections

on, their learning strategies. The researchers concluded that use of the learning logs provided rich images of learners.

Statements about students' knowledge and beliefs about learning have been used by Boulton-Lewis and her colleagues (Boulton-Lewis, 1994; Boulton-Lewis *et al.*, 1996) to inform their teaching program. At the beginning of the course, students were asked to write about a page on their ideas on learning including a description of learning, how they went about learning, what factors their thought influenced their learning, and how they knew when they had learned something. The method provided useful insight into students' knowledge and descriptions of their learning.

Student metacognitive characteristics can be assessed using inventories such as the Metacognitive Awareness Inventory (MAI) and the Perceived Self-regulatory Efficacy for Writing Scale (PSEWS).

The MAI, developed by Schraw and Dennison (1994), is a 52 item self-report instrument that measures the two components of metacognition, namely knowledge about and regulation of cognition. The MAI takes about 10 minutes to complete. The developers report that the instrument reliably measures both knowledge of cognition and regulation of cognition and that its internal consistency is excellent.

The PSEWS, developed by Zimmerman and Bandura (1994), is a 25 item Likert-type scale that measures students' perceived ability to manage and regulate writing. The PSEWS specifically focuses on students' ability to manage the writing task in terms of planning and organisation, creativity, and self-management and motivation. The developers report that the instrument is a reliable and useful predictor of student performance on writing tasks.

Student affective characteristics can be assessed using instruments such as the State-Trait Anxiety Inventory (STAI) and the Affective Adjective Checklist (AACL). The STAI, developed by Spielberger (1983), is a 40 item Likert-type self-report instrument that measures state and trait anxiety. The STAI consists of two separate scales—state and trait—each consisting of 20 statements. The state anxiety scale assesses how respondents feel “*right now, at this moment*”, while the trait scale assesses how respondents feel “*generally*”. Each scale takes about 10 minutes to complete. The scales are reliable with high internal consistency and provide valid measures of state and trait anxiety. The STAI has been widely used including in education where it has been used, for example, in the learning strategies course offered at the University of Texas (Weinstein, 1988). The AACL, developed by Zuckerman (1960) and modified by Docking and Thornton (1979), is a self-report checklist that measures anxiety. It consists of 21 key adjectives embedded in a total of 60 adjectives with various affective connotations, arranged in alphabetical order. Respondents underline the words which describe how they generally feel about a particular situation. The AACL takes about two minutes to complete and is easy to use. It is a well validated and reliable instrument (Fraser & Fisher, 1982; Zuckerman, 1960).

Student cognitive, metacognitive and motivational characteristics can also be assessed indirectly through assessing the approach to learning that students adopt. A number of self-report instruments that assess approaches to learning have been developed. The best known of these are the Approaches to Study Inventory



(ASI) and the Study Process Questionnaire (SPQ). The ASI, developed by Entwistle and Ramsden (1983), is a 64 item inventory that measures students' motives for learning and their learning strategy use in terms of meaning, reproducing and achieving orientations. The SPQ, developed by Biggs (1987), is a 42 item Likert-type instrument that measures students' motives for learning and their learning strategy use in terms of deep, surface and achieving approaches. Both instruments have been extensively researched and used to understand and improve student learning (Biggs, 1993).

It is clear from this brief overview of assessment methods that there are many different ways in which teachers and students can gain useful information about student cognition, metacognition, motivation and affect. Most of the methods outlined above can be integrated into courses as part of normal teaching and assessment activities as the following examples illustrate. One way is to ask students to complete the MSLQ at the start of a course and again, after the mid-semester test. Students then analyse their responses and reflect on any changes. Based on their reflections and their performance on the test, students write a self-reflective commentary about how they will adapt their learning. This commentary forms a part of their assessment for the course and carries a weighting of 10 to 15 percent. A similar approach to helping students to be effective learners was used by de la Harpe and Radloff (1999).

Another way is to ask students to keep a personal learning log in which they reflect on their learning experiences. This method has been successfully used by Dart and Clarke (1991) as part of a course which aimed to help students to develop self-regulation of learning. Students discussed keeping logs, developed goals for their logs, and determined individual criteria for assessing their logs. Logs were allocated 20 percent of the total marks for the course. Students discussed their log entries with peers and teachers, and teachers used the logs to provide feedback to students and to inform their teaching. An additional way is to get students, using the SRLIS, to interview one another about how they went about a particular learning task. Students then compare and reflect on the different approaches used and how these related to the learning outcomes they achieved. Students present their findings in a written report. Again, such an activity is allocated 10 to 15 percent of the total mark for the course.

Integrating these assessment methods into regular teaching may be challenging for both students and teachers. Students may be reluctant to engage in activities that focus on learning rather than on course content and may not devote the time and effort needed to complete assessment tasks effectively. Teachers may be concerned that time is being taken from subject content and that they are not best placed to develop and assess these characteristics. However, these challenges can be met provided careful attention is given to the following issues. First, course objectives are adapted to include a focus on the characteristics of lifelong learning as an integral part of the course rather than as an add-on. Second, students are informed about the focus on learning and why it has been included. Finally, efforts are made to create a classroom context that values such characteristics and creates opportunities for their development.

### **Value of Assessing Lifelong Learning Characteristics**

Using the assessment methods described above has been shown to help students to be more informed about how they can be effective lifelong learners. In order for students to become independent lifelong learners, they need to "... learn to be self-reflective, to understand why they believe, think, and act as they do—and to value self-reflection" (Angelo, 1991, p. 19). Encouraging students to reflect on the characteristics of effective learning helps them to continue developing as learners and to improve their learning outcomes (Atkins & Murphy, 1993).

These methods also help teachers to be more informed since, as Pintrich and Johnson (1990, p. 83) note, "[b]esides helping students become more aware, the information generated by these instruments can enlighten faculty members about the general cognitive and motivational characteristics of their students". Getting feedback on cognitive, metacognitive, motivational and affective aspects of learning provides teachers with 'snapshots' of student progress towards lifelong learning. According to Pintrich and Johnson (1990, p. 89):

... [t]his type of feedback can be very useful to faculty members since it describes in detail and complexity the nature of their students. This type of descriptive information on the class can be much richer than the simple descriptions many faculty members might normally generate in the course of a semester (for example, 'They do not learn because they are too stupid' and 'They are not interested') ... The information provides a concrete and specific language for a discussion of how students learn and how they are motivated.

This information, in turn, can be used in course planning and teaching.

### **Conclusion**

As highlighted in this paper, an important goal of university study is the development of lifelong learning. Students are most likely to develop the characteristics of lifelong learners when these are developed as a legitimate part of the curriculum. Thus, courses should include "... socialising students and promoting their affective and personal development in addition to success in fostering their mastery of formal curricula" (Brophy & Good, 1986, p. 328). This approach ensures that the process of learning is valued and acknowledged rather than being seen as an add-on or adjunct to "core content".

In this paper, we have suggested that the traditional approach to teaching and learning in which assessment focuses mainly on content knowledge needs to be expanded to include assessment of the characteristics of lifelong learning. These characteristics can be assessed using a variety of methods including questionnaires, teacher-constructed assessment techniques, interviews and writing activities. The outcomes of such assessment can help both teachers and students to be better informed about developing effective lifelong learning characteristics.

Teaching students to be effective lifelong learners in the context of their university

study holds out "... the promise to students that they can control and change their learning ... [and] suggests that faculty can take a more active and direct role in helping students improve their learning" (Pintrich & Johnson, 1990, p. 85). Moreover, it challenges teachers and students to promote an approach to teaching and learning which will contribute to the creation of a learning society.

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