What constitutes the surface approach to learning in the light of new empirical evidence?

Sari Lindblom-Ylänne, Anna Parpala & Liisa Postareff

Routledge
Taylor & Francis Group

What constitutes the surface approach to learning in the light of new empirical evidence?

Sari Lindblom-Ylänne [a], Anna Parpala [a] and Liisa Postareff[b]

[a]Centre for University Teaching and Learning, Faculty of Educational Sciences, University of Helsinki, Helsinki, Finland; [b]Unit for University Pedagogy, Department of Teacher Education, University of Turku, Turku, Finland

ABSTRACT

This study aims, firstly, to examine the nature of the surface approach to learning in today's university context, and secondly, to explore the factors that explain variations in the use of this approach. The 61 participants were studying in six Bachelor programmes representing various disciplines. These students scored above average on a surface approach scale and volunteered to be interviewed. One compulsory course was selected from each programme. Five surface approach profiles emerged showing variation from a *full surface approach* to a *deep approach with memorisation*. Despite very similar high scores on the surface approach scale, students varied in their use of surface-level processes. Thus, the inventory data did not capture the full variation in the students' use of the surface approach to learning. Rich research methods are therefore needed to better understand the nature of students' personal aims as well as their study processes and practices.

Introduction

The Student Approaches to Learning (SAL) research tradition has a long history in European as well as worldwide research on student learning, especially in the context of higher education (e.g. Biggs 1987; Entwistle and Ramsden 1983; Lonka, Olkinuora, and Mäkinen 2004; Prosser and Trigwell 1999; Vanthournout, Donche, Gijbels, and Van Petegem, 2013). Variations in the nature of students' learning processes were recognised in the 1970s. Marton and Säljö, for example, gave students an article to read, and then the students were asked to describe what the author's main message was and how they had approached the reading task. On the basis of their results, Marton and Säljö (1976, 1997) introduced two qualitatively different ways in which information can be processed: surface and deep. Later, 'surface- and deep-level processing' were replaced by the term 'approaches to learning'. Approaches to learning refer to students' intentions concerning their studying and learning, as well as to the learning processes they apply to reach their aims (e.g. Entwistle 1988; Entwistle and Ramsden 1983; Entwistle, McCune, and Sheja 2006).

Three approaches have been recognised in a large body of literature: The *surface approach* is characterised by preoccupation with unreflective strategies, such as memorising and reproducing the learning material and an intention to simply learn facts in order to pass a course (e.g. Prosser and Trigwell 1998; Spada and Moneta 2012). Furthermore, the surface approach has also been found to be associated with students' inability to see relationships between ideas or concepts, i.e.

their knowledge is fragmented (Meyer 1991). The *deep approach* refers to the intention of students to understand information by relating ideas to each other and using evidence. Students applying the deep approach emphasise the importance of critical thinking and creating their own understanding of the topics under study. The third approach, *organised studying (*previously called the *strategic approach*), refers to students' everyday study practices in terms of how they organise their studies and manage their time. It is therefore considered to be more of an approach to studying than an approach to learning (Entwistle 2009; Entwistle and McCune 2004).

On the basis of Marton's research and that of other scholars such as Entwistle and Ramsden, several inventories have been designed to measure the approaches to learning. Examples of these are the Approaches to Studying Inventory (ASI) by Entwistle and Ramsden (1983), the Revised Approaches to Studying Inventory (RASI) and the Approaches and Study Skills Inventory for Students (ASSIST) by Tait, Entwistle, and McCune (1998), as well as the Approaches to Learning and Studying Inventory (ALSI) and the Learning and Studying Questionnaire (LSQ) by Entwistle, McCune, and Hounsell (2003). In addition, John Biggs designed the Study Process Questionnaire SPQ in 1987 and later published a revised version of it (R-SPQ-2F) together with his colleagues (Biggs, Kember, and Leung 2001). More recently, an instrument called HowULearn (Hailikari and Parpala 2014; Herrmann, Bager-Elsborg, and Parpala 2017; Parpala and Lindblom-Ylänne 2012) was developed on the basis of the ALSI and LSQ. Moreover, it uses some items from the Revised Learning Process Questionnaire (R-LPQ-2F), an instrument parallel to the R-SPQ-2F but designed especially for secondary education (Kember, Biggs, and Leung 2004), to measure deep approaches to learning. The scales measuring the approaches to learning have evolved in recent decades on the basis of new empirical evidence to better capture the essence of these approaches. However, the basic principles of defining the approaches to learning have remained quite unchanged.

The present study examines the nature of 'surface learning' in today's university context. Since its recognition in the 1970s, the definition of the surface approach has remained almost unchanged, while learning and studying at the university have changed remarkably in recent decades. For example, skills to apply digital technologies (Thompson 2013) and to critically analyse and efficiently search for relevant and reliable information from a vast body of information are increasingly important in today's studying. These are examples of skills that require the deep approach to learning, more precisely, relating ideas and using evidence (Entwistle 2009). For this reason, the main body of research on the approaches to learning has concentrated on the deep approach, and in particular on explaining factors contributing to high-quality learning outcomes and successful studying. This is understandable, because the deep approach to learning is the 'natural' approach (Biggs 1993), and desirable in highly demanding university contexts (Parpala 2010). What has not been focused on is what actually constitutes the surface approach to learning in today's higher education although we know that this approach can still be detected among higher education students (Asikainen et al. 2013). Moreover, it is crucial to develop a coherent and consistent conceptualisation of the surface approach to learning (Howie and Bagnall 2013) in order to find ways to support students to apply the deep instead of surface approach to learning.

Many factors have been shown to be related to the use of the surface approach. There is evidence of disciplinary variation in the use of different approaches to learning (e.g. Baeten et al. 2010; Entwistle and Ramsden 1983; Lindblom-Ylänne, Parpala, and Postareff 2015a; Smith and Miller 2005). Science and applied-science students have been shown to score on average higher with the surface approach to learning compared to humanities and social-science students (Nelson Laird et al. 2008; Parpala et al. 2010). Furthermore, the teaching and study methods as well as students' personal characteristics affect the study processes of students (e.g. Entwistle 2009; Entwistle, McCune, and Walker 2001). Using survey data, previous research has identified several factors that are related to use of the surface approach. Extrinsic or low motivation to study is related to high scores in the surface approach (e.g. Kyndt et al. 2011a), as is low interest in the study field (e.g. Coertjens et al. 2016). Furthermore, weak self-efficacy beliefs tend to promote the adoption of the surface approach (e.g. Lindblom-Ylänne et al. 2015b). Students who apply the surface approach to learning often experience heavy workload or even stress and have negative perceptions of the teaching-learning environment (Kyndt et al. 2011b;

Spada and Moneta 2012). Lack of self-regulation skills or external regulation as well as lack of organised studying are also related to using the surface approach, and particularly the formation of a fragmented knowledge base (Coertjens et al. 2016; Hailikari, Tuononen, and Parpala 2016; Vermunt 2005; Heikkilä et al. 2012; (Beishuizen, Stoutjesdijk, and van Putten 1994; Lindblom-Ylänne 1999; Lonka and Lindblom-Ylänne 1996; Vermunt and van Rijswijk 1988; Parpala et al. 2010). In addition, too many challenges, or too few, when studying have been shown to steer students towards applying the surface instead of deep approach (Coertjens et al. 2016; Postareff, Lindblom-Ylänne, and Parpala 2014). Finally, evidence suggests that the study success of students who apply the surface approach to learning is less than that of those who apply the deep approach (e.g. Amirali, Huon, and Bird 2004; Diseth and Martinsen 2003), but there is also evidence of good grades being achieved through the surface approach (e.g. Asikainen et al. 2013).

Aims

The aims of the present study are twofold. Firstly, the objective is to examine the nature and elements of the surface approach to learning in today's university context, and, further, see what kind of variation can be detected in these elements in students' spontaneous descriptions of their studying. We predict that the 'full' surface approach, traditionally viewed as memorising, unreflective studying and fragmented knowledge, is rare among university students, because it is less and less relevant and functional in today's university. Secondly, the aim is to explore factors that are related to variations in the use of the surface approach. We predict that several factors contribute to this variation, and that how these factors emerge is related to students' individual surface approach profiles.

Method

Participants

The participants were 61 Bachelor-level students majoring in different disciplines from a research-intensive university: 14 from bio- and environmental sciences, 11 from educational sciences, 13 from humanities, 6 from mathematics, 13 from theology and 4 from veterinary medicine.

The majority of the participants were female (77.0%; $n = 47$). Female students were over-represented in the sample, comprising 60% of all participants studying in the selected disciplines. The mean age was 23 years, varying in the six programmes from 22 years (mathematics) to 25 years (theology). Due to the low number of participants in some of the programmes, the study did not investigate disciplinary differences; nor did it examine gender or age differences.

Materials

The study combined survey data with interview data. We selected the participants from a large multi-disciplinary sample of Bachelor students ($N = 1008$). The students in the sample had filled in the HowULearn inventory (Hailikari and Parpala 2014; Parpala and Lindblom-Ylänne 2012), and 213 of them had also participated in an interview. The sample of the present study comprised the 61 students of the 213 interviewed students who scored above average on the four-item surface approach scale of the HowULearn questionnaire.

In earlier studies, two somewhat different factors have been reported within the surface approach, one indicating Fragmented knowledge, Memorising without understanding and Fear of failure, and the other indicating Unthinking acceptance and a Lack of engagement (Entwistle 1998; Entwistle and McCune 2004). We used the most recent version of the HowULearn questionnaire in which the surface approach items concentrate on measuring only the first-mentioned factor reflecting the Fragmented knowledge and Memorising without understanding (see Table 1) because this four-item scale seems to be very robust (Parpala and Lindblom-Ylänne 2012). The reliabilities in the newest

Table 1. Surface approach scale items used in the study.

Surface approach scale item	Element of the surface approach
I often have trouble making sense of the things I have to learn.	Memorising without understanding
I am unable to understand the topics I need to learn because they are so complicated.	Fragmented knowledge
Much of what I've learned seems to be no more than unrelated bits and pieces.	Fragmented knowledge
I often have to repeat things in order to learn them.	Memorisation without understanding

version of the instrument have been good, with a Cronbach's alpha over .70 (Hailikari and Parpala 2014; Herrmann, Bager-Elsborg, and Parpala 2017).

The average surface approach scores were calculated separately for each disciplinary group (see Table 2), because earlier studies have shown disciplinary variation in the surface approach (e.g. Parpala et al. 2010). These discipline-specific average scores were used as the cutting points. Thus, all interviewed students who scored above average on the surface approach comprised the sample of the study.

Completing the questionnaire was voluntary, as was participation in an interview after answering the HowULearn questionnaire. The students gave their informed consent to participate in the interviews and were told that they could withdraw at any time. The students filled in the inventory at the beginning of the course and were interviewed after participating in a compulsory Bachelor-level course in their major subjects. Therefore, both the inventory items and interview themes were contextualised in the students' major subjects. No incentives were given to participate.

Because the HowULearn surface approach scale concentrates only on measuring memorising without understanding and the experience of a fragmented knowledge base, the focus of the interviews was broader. We wanted to capture in more depth the nature and variation in the students' personal study aims and the study processes they were using to reach their aims in today's university context. The interviews concentrated on three themes, but were open and flexible in nature and allowed other themes as well if raised by the students. The first theme was the students' approaches to learning, more precisely, their personal aims for studying as well as the study processes and practices they applied to realise these aims. Through this theme, we wanted to see how the pivotal elements as defined in the literature, i.e. memorising, unreflective studying, fragmented knowledge, simply learning facts to pass courses, and possible new elements, arose spontaneously in the data. The second theme concentrated on the students' evaluations of their study practices and processes during their courses and how they thought they had realised their personal aims. The third theme covered factors that the students saw as enhancing or impeding their studying. Such factors as motivation to study or self-regulation skills – or a lack of these – were not explicitly suggested or listed by the interviewers, because we wanted the interviewees on their own initiative to explain their own experiences and views.

Due to the sizable number of interviews required for the large multidisciplinary sample, several researchers from the research group acted as interviewers. The third author was the main interviewer and instructed the other interviewers accordingly to guarantee that all interviews proceeded the same way and that all themes were covered. Each author also listened to 10 randomly selected interviews to help ensure that the themes remained as uniform as possible in all interviews.

Table 2. Means and standard deviations of the surface approach in different disciplines ($N = 1008$).

Discipline	Mean (StD) of the surface approach (max score 5)	Number of students who completed the questionnaire
Biosciences	2.66 (.65)	299
Educational sciences	2.56 (.62)	142
Humanities	2.46 (.67)	127
Mathematics	2.72 (.71)	224
Theology	2.48 (.58)	163
Veterinary medicine	2.82 (.60)	53

The length of the interviews varied from approximately 40 minutes to an hour. All interviews were conducted in the students' native language and recorded and transcribed verbatim. The selected extracts were translated into English, and, due to this translation process, do not represent authentic spoken English. To ensure the anonymity of the interviewees, the age, gender and discipline of the participants are not revealed in the results. All students are referred to as 'she'.

Procedure

The data were analysed using the method of abductive content analysis by identifying themes from the data and linking them to our theoretical understanding based on previous studies. The aim of abductive reasoning is to understand the phenomenon based on prior studies, as well as to generate novel theoretical insights that reframe empirical findings in contrast to existing theories (Timmermans and Tavory 2012). Therefore the scope and sophistication of the theoretical background has a great impact on the analysis (Timmermans and Tavory 2012).

The analysis process consisted of three phases. The first comprised four rounds, each focusing on searching for one of the four pivotal elements (or lack of them) which had been shown by previous research to be characteristic of the surface approach to learning. Because our aim was to reconceptualise the surface approach to capture today's university context, we were also open to other elements if they emerged in the data.

The four pivotal elements are presented in Table 3 with specific criteria for each element. This phase was carried out by the first author, who created a rubric of all extracts of each interviewee related to the four pivotal and other possible new elements. At the end of the first phase, the second and third authors compared the rubric constructed by the first author with the transcribed interviews in the light of the criteria for the elements. The agreement was almost 100%. Only in the case of one student was an extract from the interview concerning unreflective studying added in the rubric, which had been missed by the first author. The authors were able to categorise all elements spontaneously mentioned by the students into the four pivotal elements. Thus, no new elements were added. At the end of the first phase, all authors together created a synthesis of the observed variations in the four elements among the 61 students.

The second phase concerned the creation of the student profiles on the basis of the variations in the four surface approach elements. This phase was person-oriented; in other words, the unit of analysis was one student. All three authors participated in creating the student profiles. Each author independently grouped the students according to evidence (or lack of it) of the four

Table 3. Four pivotal elements of the surface approach, and criteria used for each element.

The elements of the surface approach	Criteria
1) Aim to learn facts to pass a course	aim to learn more
	aim to complete an assignment or degree
	aim to pass a course
2) Memorisation	repetition of knowledge
	learning by heart
	concentration on remembering facts
3) Unreflective studying	lack of clear study plans
	no assessment of one's own learning
	no ownership of one's own study process
	following teachers' instructions without contemplating them
	lack of critical thinking
4) Fragmented knowledge	experiences of fragmented knowledge structures or knowledge base
	experiences of knowledge gaps
	forgetting after exams
	difficulties in linking new knowledge with previous knowledge
	difficulties in creating coherent general pictures

pivotal surface approach elements. Five surface profiles emerged from the data. The authors were unanimous in categorising the students into the five profiles.

The third phase focused on exploring factors which have been shown by research to be related to, or to explain, the variation in students' approaches to learning. However, as in the first phase, we were open to any additional factors arising from the data. For the third phase, the following seven factors were formulated on the basis of empirical evidence of the relationship between the surface approach and these factors:

(1) low motivation to study or extrinsic motivation
(2) low interest or lack of interest in the study field or discipline
(3) experience of a heavy workload and/or stress
(4) low self-efficacy beliefs to successfully study in the programme
(5) lack of self-regulation of learning, external regulation or lack of regulation
(6) lack of organised studying and effort management
(7) negative perceptions of the teaching-learning environment and/or negative study experiences

The third phase was also person-oriented and consisted of several rounds. Each round concentrated on exploring one of the factors explaining the variations in the approaches to learning. The last round concentrated on possible new factors that were not listed above. As in the previous phases, the first author carried out the analysis. Then the second and third authors independently checked the transcribed interviews in the light of the seven and possible new factors, and made small alterations in the analyses of five students. Because the seven listed factors were all quite broad, no new categorises emerged. Finally, all authors completed the categorisation of the 61 participants.

Results

The first aim of the study was to explore how the surface approach to learning emerges in today's university students' studying. Five surface profiles arose from the data (for a summary of all profiles, see Table 4 below). Ten students (16%) were categorised in the *Full surface approach* profile. All four elements, more precisely, aiming to learn facts in order to pass the course, memorisation, unreflective studying and fragmented knowledge were evident in these students' interviews. The following extract is representative of the students who were categorised in this profile:

> In high school I aimed at high grades and was ambitious. Here my aims are lower, because students are so good here. So mostly my first aim is to pass a course. Of course I also aim to learn some content [laughs], but I have a bad habit of trying to learn by heart a lot of facts in a short time. I kind of memorise things "for the exam", to pass it. Therefore I tend to forget the facts after the exam. (Student 30)

Table 4. Summary of the five profiles in the light of the four pivotal elements of the surface approach ($N = 61$).

Pivotal elements	Profiles				
	Full surface approach ($n = 10$)	Surface approach with the aim to understand ($n = 15$)	Surface approach with deep processes ($n = 5$)	Mixed approach without fragmented knowledge ($n = 22$)	Deep approach with memorisation ($n = 9$)
Aim to learn facts	+	+ and an aim to understand	+ and an aim to understand	+ and an aim to understand	−
Memorisation	+	+	+ and some deep processes	+ and some deep processes	+ and deep processes
Unreflective studying	+	+	+	+	− (+)
Fragmented knowledge	+	+	+	−	−

Note: '+' refers to a detected surface element and '−' to a missing element.

The second profile, *Surface approach with the aim to understand*, consisted of 15 students (25%). As in the Full surface approach profile, all four elements of the surface approach were visible in these students' interviews. However, while none of the 10 students categorised in the Full surface approach profile expressed an aim to understand, the students in this profile systematically aimed at understanding in addition to learning facts in order to pass the course. The following two extracts are characteristic of the students in this profile. They show that in addition to aiming to learn facts in order to pass courses, the students had aimed at understanding:

> Well, understanding is the most important thing and then of course memorising, because I like to learn facts by heart. In this way I get the feeling that I really know something, that something remains in my memory. And it's really nice that I'm still able to remember facts after a long time. That feels really fruitful. Maybe it's a bit stupid, but to me it's worth the trouble. (Student 13)

> Real learning to me is that you don't learn by heart, but instead create meaning. Of course you don't have to understand everything, but at least the main points. In this way you can retrieve information from memory and use this knowledge in the next courses. [My discipline] requires quite a lot of memorising. There is a kind of atmosphere here that you need to learn facts by heart. (Student 16)

The smallest profile, *Surface approach with deep processes*, only comprised five students (8%). Similarly to the students in the second profile, these students aimed at understanding in addition to learning facts in order to pass courses. Furthermore, the interviews showed evidence of the use of some deep processes, such as integrating information or searching for evidence, in addition to surface-level processes:

> My aim is to remember information longer than just for the exams. This is why I need to read the material several times. I have unfortunately taken some exams for which I've only studied just before them and not actively during the course, and I've noticed that I have forgot most of the content. It would be nice to remember and to be able to use the knowledge I have learned later as well. Therefore, I like to combine and integrate information. In this way I'm able to commit information to my long-term memory. (Student 22)

The fourth profile, the largest, was entitled *Mixed approach without fragmented knowledge*. Twenty-two students (36%) were categorised in this profile. As in the second and third profiles, the students categorised here aimed at understanding in addition to learning facts, and showed evidence of applying deep processes on the side of using the surface-level processes. Characteristic of all students was the lack of fragmented knowledge. The following extracts show the mixed approaches of the students in this profile:

> I have tried to internalise the content, but because there is so much to learn I need to decide what parts to memorise. Like, these I just learn by heart for the exam and the rest I really try to learn and internalise. There is a problem, however, because if you just memorise facts, you will forget them and have to learn them again. So if I could minimise learning by heart and understand more and more, then I could use my knowledge easier later in my studies. (Student 40)

> I try to form a general picture by thinking about the core message in a book. So learning by heart is not a good way to study, because I have such a bad memory. I have noticed that little by little I have developed and I have been able to use a more selective study method and concentrate on the most important information. I need to write down everything. When I read a book, I need to document everything, write my own comments, draw arrows and the like. If I just read, I can read many pages without understanding at all. Writing for me is a way to create understanding. (Student 56)

The fifth profile, *Deep approach with memorisation,* comprised nine students (15%). These students clearly expressed the aims and study processes characteristic of the deep approach, such as attempting to understanding and think critically. In addition to applying the elements of the deep approach, all students mentioned a few study processes typical of the surface approach. All except for one student showed evidence of memorisation combined with deep processes, as the following typical extract shows:

> First comes the kind of "raw work". By this I mean memorising facts, which does not require understanding or deeper analysis. After this I begin to combine information to form a kind of a larger skeleton. I add facts to this skeleton all the time. Of course, even when memorising, I keep in mind this skeleton so that I'm aware of what I'm learning at that moment. It's important to integrate facts into a larger picture. In this way it is easier to retrieve information from memory. I might forget minor details, but because I have this big picture, it is easy to complement this big picture later. (Student 15)

The remaining student applied a very routine-like study process echoing unreflective studying combined with aims and study processes typical of the deep approach:

> I learn best by listening in lectures and taking notes. Then I study these notes later at home. For me writing is important. It is much more difficult to just study the teacher's slides or notes. I learn by writing myself. I'm not here just to earn a degree. I study because of pure interest in [my discipline]. I want to learn to understand life, society and people better. It's so important to learn to understand and learn new things. (Student 43)

The following summary in Table 4 pulls together the essentials of the five profiles.

Factors explaining variation in the use of the surface approach

The second aim of the study was to explore factors that are related to variation in the use of the surface approach. The factors were divided into seven broad categories: low interest in studying, low motivation to study, experience of a heavy workload, low self-efficacy beliefs, lack of self-regulation of learning, lack of organised studying and negative study experiences (Table 5).

However, there was variation in both how frequently the factors were mentioned and how common they were in the five profiles. Unorganised studying was clearly the most frequently mentioned factor. Half of the students mentioned problems in time and effort management. However, no one in the fifth profile, Deep approach with memorisation, expressed problems in organised studying (see Figure 1). Thirty per cent of the students had lacked motivation to study at least temporarily, but there were differences between the profiles: 70% of the students categorised in the Full surface approach mentioned lack of motivation compared to none in the Deep approach with memorisation profile. Thirty per cent of the students had doubted their own capabilities to study successfully – in other words, showing low self-efficacy beliefs – but these students were unevenly distributed in the five profiles. Low self-efficacy beliefs were the most common in the third profile, Surface approach with some deep processes (60%), and almost as common in the Full surface approach profile (50%). A third of the students categorised in the second profile, Surface approach with an aim to understand, expressed low self-efficacy beliefs, but only one student in the fifth profile, Deep approach with memorisation, doubted her own capabilities.

A quarter the students experienced problems in self-regulation and had relied more on external regulation, but variation in this factor was also noted: half of the students in the Full surface approach profile and a third of those in the Surface approach with an aim to understand profile lacked self-regulation skills, but in the other profiles self-regulation had been experienced as difficult by only one or two students. A quarter of the students expressed negative study experiences, which were most common in the first three profiles (33–40%), and no one in the Deep approach with memorisation profile had had negative study experiences. Lack of interest was only mentioned by 12 students

Table 5. Frequencies and percentages of elements related to the surface approach from the most common to the least ($N = 61$).

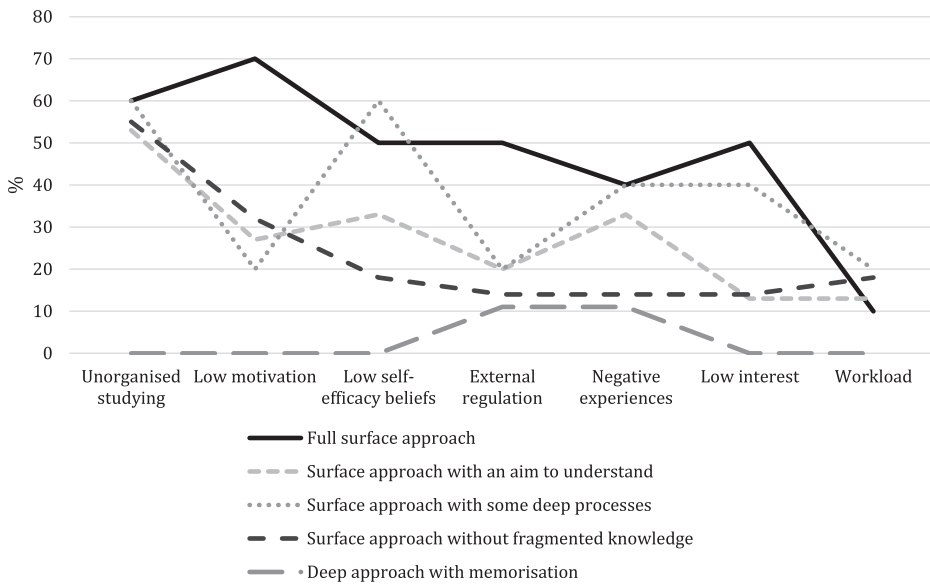| Elements related to the surface approach	F (%)
Lack of organised studying	29 (48)
Low motivation to study	19 (31)
Weak self-efficacy beliefs	18 (30)
Lack of self-regulation	15 (25)
Negative study experiences	15 (25)
Low interest in studying	12 (20)
Experience of heavy workload	4 (7)

Figure 1. Variation in factors explaining the surface approach in the five profiles ($N = 61$).

(20%), but was common among students in the Full surface approach profile (50%). Surprisingly, the experience of a heavy workload was mentioned by only four students (7%) who were categorised in the first three profiles. All four students expressed having only a light workload, and none mentioned experiences of stress. Figure 1 pulls together the variation in the seven factors of the five profiles.

Discussion

For the present study, two predictions were constructed. The first was that the full surface approach is rare among university students, because it is not relevant or functional in universities today. The results supported this prediction, because only 16% of the students showed all four elements of the surface approach. This is a small percentage considering that the study's 61 participants were selected because of their above-average scores on the surface approach scale. This indicates a mismatch between the survey and interview results. However, the survey focused only on memorisation and fragmented knowledge, and therefore does not capture all elements of the surface approach. Neither did we take into account the combinations of the different approaches to learning at the person level, although there is evidence of some students scoring high on both scales, deep and surface (e.g. Lindblom-Ylänne 2003). It seems that in order to explore the nature of the surface approach and how students apply it in today's university, mixed- or multi-method and profile-oriented approaches are needed. It is worrying that too much research on students' approaches to learning relies only on survey data without a person-oriented approach. It is crucial that the scales measuring the approaches to learning be continuously developed to better capture current study practices and the requirements for successful studying.

As with the Full surface approach, the other profiles were also more or less combinations of surface- and deep-level processes. They could thus be described as dissonant (Lindblom-Ylänne 2003; Meyer 2000a), a phenomenon which has been shown to be detrimental to successful studying (e.g. Lindblom-Ylänne and Lonka 1998, 2000). However, dissonance might not always be harmful, because it can reflect a developmental phase in students' study practices and skills during which students construct new and more functional study processes. This kind of developmental phase has

been identified among university teachers who show dissonant profiles in their approaches to teaching (Postareff et al. 2008).

Meyer (2000b) explored the contrasting forms of memorisation and concluded that students applying the surface approach tend to score higher on the Reflections on Learning Inventory (RoLI) scales Memorising before understanding and Memorising as rehearsal. A similar trend was also detected in the present study: the students who were categorised in the second and third profiles, Surface approach with an aim to understand and Surface approach with deep processes, preferred to keep studying difficult content until an understanding was reached. Meyer (2000b) also showed that the RoLI scale Memorising after understanding was related to the deep approach to learning, which is in line with the combination of memorisation and deep processes in the fifth profile, Deep approach with memorisation.

The second prediction was that several factors contribute to the variation in use of the surface approach, and that how these factors emerge is related to students' individual surface approach profiles. The results showed that a lack of organised studying was the most frequently detected factor related to using the surface approach. Interestingly, none of the students in the fifth profile, Deep approach with memorisation, described unorganised studying. Thus among the students participating in the research, unorganised studying seemed to be clearly related to adopting the surface rather than deep approach. The relation between unorganised studying and the surface approach has been found in several quantitative studies (e.g. Entwistle et al. 2000; Parpala et al. 2010). Interestingly, in the most recent studies, also a combination of unorganised studying and deep approach has been detected among university students (Haarala-Muhonen et al. 2017; Karagiannopoulou and Milienos 2013; Parpala et al. 2010). Approximately half of the students participating in the present study had had problems in organised studying and effort management. However, other factors as well, such as low motivation to study, low self-efficacy beliefs and negative study experiences were related to employing the surface approach. It may be concluded that use of the surface approach is seldom due to one factor only. Instead, it seems that several factors contribute to its use and that the particular combinations of these factors are very individual in nature. Similarly, a recent study by Coertjens et al. (2016) indicated that high surface approach scores at the course level were often related to a mixture of experiencing a lack of challenges, low interest and low investment of time and effort in studying during courses.

Even though we were open to finding both new elements describing the surface approach and new factors explaining variations in its use, we did not detect any. We could easily categorise all interview data into the existing four pivotal elements of the surface approach. The same concerned the factors explaining variations in the surface approach, which we defined on the basis of a rich body of previous research. However, there seemed to be a change in the relative significance of the pivotal elements in the surface approach. The aim to learn facts was most often combined with the aim to understand, and memorisation was enriched with at least some deep processes. Only in the Full surface approach were these elements detected without any evidence of deep-level aims or study processes.

We suggest that *unreflective approach* could better and more neutrally describe these students' approach to learning. Unreflective studying and experience of a fragmented knowledge base seem to be at the core of the surface approach of the twenty-first century. These two elements capture different phases of the study process: unreflective studying describes students' study practices, whereas fragmented knowledge is the outcome of the learning process. We argue that the term 'surface' does not fully capture the learning processes of students who rely on memorisation, lack a reflective approach to their studying and find that their knowledge base is fragmented. We acknowledge that these are more surface-level than deep-level processes. Unfortunately, 'surface' can also be interpreted as reflecting superficiality, or even a 'shallow' personality, and therefore the term carries a negative connotation. Finally, we would like to keep the term 'approach', because it appropriately captures the two important elements of learning: students' personal learning and studying aims, and the study processes they use to realise their aims.

The present study has several limitations. It must be emphasised that the results cannot be generalised to all university education even though the students represented a variety of disciplines. Furthermore, the sample size of 61 students was quite small. More research with larger sample sizes and a broader selection of disciplines is needed. We also need follow-up studies to examine how using the surface approach evolves during university education. Furthermore, we require more than self-report measures in order to fully capture the processes and elements of the surface approach to learning. Finally, we emphasise that our focus has been on the dimensions related to the study processes leaving out other factors, such as personality and social background of the students.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Sari Lindblom-Ylänne 🔟 https://orcid.org/0000-0001-7297-7433
Anna Parpala 🔟 http://orcid.org/0000-0001-5822-6983

References

Amirali, Minbashian, Gail Huon, and Kevin D. Bird. 2004. "Approaches to Studying and Academic Performance in Short Essay Exams." *Higher Education* 47 (2): 161–176.

Asikainen, Henna, Viivi Virtanen, Anna Parpala, and Sari Lindblom-Ylänne. 2013. "Understanding the Variation in Bioscience Students' Conceptions of Learning in the 21st Century." *International Journal of Educational Research* 62: 36–42.

Baeten, Marlies, Eva Kyndt, Katrien Struyven, and Filip Dochy. 2010. "Using Student-Centred Learning Environments to Stimulate Deep Approaches to Learning: Factors Encouraging or Discouraging their Effectiveness." *Educational Research Review* 5 (3): 243–260.

Beishuizen, Jos, Evelien Stoutjesdijk, and K. van Putten. 1994. "Studying Textbooks: Effects of Learning Styles, Study Task, and Instruction." *Learning and Instruction* 4: 151–174.

Biggs, John. 1987. *Student Approaches to Learning and Studying: Research Monograph*. Melbourne, Australia: Australian Council for Educational Research.

Biggs, John. 1993. "What Do Inventories of Students' Learning Processes Really Measure? A Theoretical Review and Clarification." *British Journal of Educational Psychology* 63 (1): 3–19.

Biggs, John, David Kember, and Doris Y. P. Leung. 2001. "The Revised Two Factor Study Process Questionnaire: R-SPQ-2F." *British Journal of Educational Psychology* 71 (1): 133–149.

Coertjens, Liesje, Gert Vanthournout, Sari Lindblom-Ylänne, and Liisa Postareff. 2016. "Understanding Individual Differences in Approaches to Learning Across Courses: A Mixed Method Approach." *Learning and Individual Differences* 51: 69–80.

Diseth, Åge, and Øyvind Martinsen. 2003. "Approaches to Learning, Cognitive Style, and Motives as Predictors of Academic Achievement." *Educational Psychology* 23 (2): 195–207.

Entwistle, Noel. 1988. "Motivational Factors in Students' Approaches to Learning." In *Learning Strategies and Learning Styles*, edited by Ronald R. Schmeck, 21–51. New York: Plenum Press.

Entwistle, Noel. 1998. "Motivation and Approaches to Learning." Motivating and Conceptions of Teaching." In *Motivating Students*, edited by Brown Sally, Armstrong Steve, and Thomson Gail, 15–24. London: Kogan Page.

Entwistle, Noel. 2009. *Teaching for Understanding at University: Deep Approaches and Distinctive Ways of Thinking*. Basingstock: Palgrave Macmillan.

Entwistle, Noel, Hilary Tait, and Velda McCune. 2000. "Patterns of Response to Approaches to Studying Inventory across Constrasting Groups and Contexts." *European Journal of Psychology of Education* XV (1): 33–48.

Entwistle, Noel, and Velda McCune. 2004. "The Conceptual Bases of Study Strategy Inventories." *Educational Psychology Review* 16 (4): 325–345.

Entwistle, Noel, Velda McCune, and Dai Hounsell. 2003. "Investigating Ways of Enhancing University Teaching-Learning Environments: Measuring Students' Approaches to Studying and Perceptions of Teaching." In *Unravelling Basic Components and Dimensions of Powerful Learning Environments*, edited by Erik De Corte, Lieven Verschaffel, Noel Entwistle, and Jeroen van Merrienboer, 89–107. Oxford: Elsevier Science.

Entwistle, Noel, Velda McCune, and Paul Walker. 2001. "Conceptions, Styles, and Approaches within Higher Education: Analytic Abstractions and Everyday Experience." In *Perspectives on Thinking, Learning, and Cognitive Styles*, edited by Robert J. Sternberg and Lingfu F. Zhang, 197–226. Mahwah, NJ: Erlbaum.

Entwistle, Noel, Velda McCune, and Max Sheja. 2006. "Student Learning in Context: Understanding the Phenomenon and the Person." In *Instructional Psychology. Past, Present, and Future Trends: Sixteen Essays in Honour of Eric De Corte*, 131–148. Amsterdam: Elsevier.

Entwistle, Noel, and Paul Ramsden. 1983. *Understanding Student Learning*. London: Croom Helm.

Haarala-Muhonen, Anne, Mirja Ruohoniemi, Anna Parpala, Erkki Komulainen, and Sari Lindblom-Ylänne. 2017. "How do the Different Study Profiles of First-year Students Predict their Study Success, Study Progress and the Completion of Degrees?" *Higher Education* 74 (6): 949–962. doi:10.1007/s10734-016-0087-8.

Hailikari, Telle, and Anna Parpala. 2014. "What Impedes or Enhances My Studying? The Interrelation between Approaches to Learning, Factors Influencing Study Progress and Earned Credits." *Teaching in Higher Education* 19 (7): 812–824.

Hailikari, Telle, Tarja Tuononen, and Anna Parpala. 2016. "Students' Experiences of the Factors Affecting Their Study Progress: Differences in Study Profiles." *Journal of Further and Higher Education* 6: 1–12.

Heikkilä, Annamari, Kirsti Lonka, Juha Nieminen, and Markku Niemivirta. 2012. "Relations between Teacher Students' Approaches to Learning, Cognitive and Attributional Strategies, Well-being, and Study Success." *Higher Education* 64: 455–471.

Herrmann, Kim Jesper, Anna Bager-Elsborg, and Anna Parpala. 2017. "Measuring Perceptions of the Learning Environment and Approaches to Learning: Validation of the Learn Questionnaire." *Scandinavian Journal of Educational Research* 61 (5): 526–539.

Howie, Peter, and Richard Bagnall. 2013. "A Critique of the Deep and Surface Approaches to Learning Model." *Teaching in Higher Education* 18 (4): 389–400.

Karagiannopoulou, Evangelia, and Fotios S. Milienos. 2013. "Exploring the Relationship between Experienced Students' Preference for Open and Closed-Book Examinations, Approaches to Learning and Achievement." *Educational Research and Evaluation* 19 (4): 271–296.

Kember, David, John Biggs, and Doris Y. P. Leung. 2004. "Examining the Multidimensionality of Approaches to Learning through the Development of a Revised Version of the Learning Process Questionnaire." *British Journal of Educational Psychology* 74 (2): 261–279.

Kyndt, Eva, Filip Dochy, Katrien Struyven, and Eduardo Cascallar. 2011a. "The Direct and Indirect Effect of Motivation for Learning on Students' Approaches to Learning through the Perceptions of Workload and Task Complexity." *Higher Education Research & Development* 30 (2): 135–150.

Kyndt, Eva, Filip Dochy, Katrien Struyven, and Eduardo Cascallar. 2011b. "The Perception of Workload and Task Complexity and its Influence on Students' Approaches to Learning: A Study in Higher Education." *European Journal of Psychology of Education* 26 (3): 393–415.

Lindblom-Ylänne, Sari. 1999. "Studying in a Traditional Medical Curriculum – Study Success, Orientations to Studying and Problems that Arise." Doctoral thesis, Helsinki University Printing House, Helsinki.

Lindblom-Ylänne, Sari. 2003. "Broadening Understanding of the Phenomenon of Dissonance." *Studies in Higher Education* 28 (1): 63–77.

Lindblom-Ylänne, Sari, and Kirsti Lonka. 1998. "Individual Ways of Interacting with the Learning Environment – Are they Related to Study Success?" *Learning and Instruction* 9: 1–18.

Lindblom-Ylänne, Sari, and Kirsti Lonka. 2000. "Dissonant Study Orchestrations of High Achieving University Students." *European Journal of Educational Psychology* 15 (1): 19–32.

Lindblom-Ylänne, Sari, Anna Parpala, and Liisa Postareff. 2015a. "Methodological Challenges in Measuring Change in Students' Learning Processes." In *World Education Research Yearbook 2015*, edited by Lory Hill and Felice Levine, 160–180. New York: Routledge.

Lindblom-Ylänne, Sari, Emmi Saariaho, Mikko Inkinen, Anne Haarala-Muhonen, and Telle Hailikari. 2015b. "Academic Procrastination, Strategic Delay and Something Betwixt and Between: An Interview Study." *Frontline Learning Research* 3 (2): 27–42.

Lonka, Kirsti, Erkki Olkinuora, and And Jarkko Mäkinen. 2004. "Aspects and Prospects of Measuring Studying and Learning in Higher Education." *Educational Psychology Review* 16 (4): 301–323.

Lonka, Kirsti, and Sari Lindblom-Ylänne. 1996. "Epistemologies, Conceptions of Learning, and Study Practices in Medicine and Psychology." *Higher Education* 31: 5–24.

Marton, Ference, and Roger Säljö. 1976. "On Qualitative Differences in Learning: I. Outcome and Process." *British Journal of Educational Psychology* 46: 4–11.

Marton, Ference, and Roger Säljö. 1997. "Approaches to Learning." In *The Experience of Learning*, edited by Ference Marton, Dai Hounsell, and Noel Entwistle, 39–58. Edinburgh: Scottish Academic Press.

Meyer, Jan H. F. 1991. "Study Orchestration: The Manifestation, Interpretation and Consequences of Contextualised Approaches to Studying." *Higher Education* 22: 297–316.

Meyer, Jan H.F. 2000a. "The Modelling of Dissonant Study Orchestration in Higher Education." *European Journal of Psychology of Education* 15 (1): 5–18.

Meyer, Jan H.F. 2000b. "An Overview of the Development and Application of the Reflections on Learning Inventory (RoLI)." Paper Presented at the RoLI Symposium, London, July 25.

Nelson Laird, Thomas, Rick Shoup, George Kuh, and Michael J. Schwarz. 2008. "The Effects of Discipline on Deep Approaches to Student Learning and College Outcomes." *Research in Higher Education* 49 (6): 469–494.

Parpala, Anna. 2010. "Exploring the Experiences and Conceptions of Good Teaching in Higher Education: Development of a Questionnaire for Assessing Students' Approaches to Learning and Experiences of the Teaching-Learning Environment." Doctoral Dissertation. University of Helsinki, Institute of Behavioural Sciences. Studies in Educational Sciences 230. Helsinki: Helsinki University Press.

Parpala, Anna, and Sari Lindblom-Ylänne. 2012. "Using a Research Instrument for Developing Quality at the University." *Quality in Higher Education* 18 (3): 313–328.

Parpala, Anna, Sari Lindblom-Ylänne, Erkki Komulainen, Topi Litmanen, and Laura Hirsto. 2010. "Students' Approaches to Learning and their Experiences of the Teaching-Learning Environment in Different Disciplines." *British Journal of Educational Psychology* 80 (2): 269–282.

Postareff, Liisa, Sari Lindblom-Ylänne, and Anna Parpala. 2014. "Explaining University Students' Strong Commitment to Understand through Individual and Contextual Elements." *Frontline Learning Research* 3: 31–49.

Postareff, Liisa, Nina Katajavuori, Sari Lindblom-Ylänne, and Keith Trigwell. 2008. "Consonance and Dissonance in Descriptions of Teaching of University Teachers." *Studies in Higher Education* 33 (1): 49–61.

Prosser, Michael, and Keith Trigwell. 1998. "Teaching in Higher Education." In *Teaching and Learning in Higher Education*. edited by Barry Dart and Gillian Boulton-Lewis, 250–268. Camberwell, Victoria: Acer.

Prosser, Michael, and Keith Trigwell. 1999. *Understanding Learning and Teaching: The Experience in Higher Education*. Buckingham: Open University Press.

Smith, Swee Noi, and Robyn J. Miller. 2005. "Learning Approaches: Examination Type, Discipline of Study, and Gender." *Educational Psychology* 25 (1): 43–53.

Spada, Marcantonio, and Giovanni B. Moneta. 2012. "A Metacognitive-Motivational Model of Surface Approach to Studying." *Educational Psychology* 32 (1): 45–62.

Tait, Hilary, Noel Entwistle, and Velda McCune. 1998. "Assist: A Reconceptualisation of the Approaches to Studying Inventory." In *Improving Students as Learners*, edited by Chris Rust, 262–271. Oxford: Oxford Brookes University, The Oxford Centre for Staff and Learning Development.

Thompson, Penny. 2013. "The Digital Natives as Learners: Technology Use Patterns and Approaches to Learning." *Computers & Education* 65: 12–33.

Timmermans, Stefan, and Iddo Tavory. 2012. "Theory Construction in Qualitative Research: From Grounded Theory to Abductive Analysis." *Sociological Theory* 30 (3): 167–186.

Vanthournout, Gert, Vincent Donche, David Gijbels, and Peter Van Petegem. 2013. '(Dis)Similarities in Research on Learning Approaches and Learning Patterns.' In *Learning Patterns in Higher Education in the 21stCentury: Dimensions and Research Perspectives*, edited by David Gijbels, Vincent Donche, John Richardson, and Jan Vermunt, 11–32. EARLI Book Series New Perspectives on Learning and Instruction. Abingdon: Routledge.

Vermunt, Jan D. 2005. "Relations between Student Learning Patterns and Personal and Contextual Factors and Academic Performance." *Higher Education* 49: 205–234.

Vermunt, Jan D. H. M., and Frank A. W. M. van Rijswijk. 1988. "Analysis and Development of Students' Skill in Self-regulated Learning." *Higher Education* 170: 647–682.