Students Approaches to Learning:

Towards a Context-specific Learning Approaches Instrument

Kapinga-Mutatayi Madeleine[1], Mukendi waMpoyi Pierre[1] & Jan Elen[2]

[1] Unikin, Faculté de Psychologie et Sciences de l'Education, Kinshasa/DRCongo

[2] KULeuven, Centre for Instructional Psychology and Technology, 3000, Leuven/ Belgium

Corresponding author. Kapinga-Mutatayi Madeleine, Unikin, Faculté de Psychologie et Sciences de l'éducation, Kinshasa/DRCongo. E-mail: madokapi@yahoo.fr; kapingadina@gmail.com.

Received: May 11, 2023 Accepted: June 10, 2023 Online Published: June 15, 2023

doi:10.5430/ijhe.v12n3p68 URL: https://doi.org/10.5430/ijhe.v12n3p68

Abstract

Students' Approaches to Learning (SAL) are a critical determinant of learning outcomes and have been assessed around the world, from Asia to Africa, using the traditional questionnaires developed in the Western context. However, studies in Asia have challenged the traditional dichotomous view of SAL by supporting the presence of intermediate approaches, suggesting that the current view of SAL may not be universal. In response to the need for a broader understanding of SAL, a new instrument, the Approaches to Learning Questionnaire (ALQ), was developed during a pilot study. This instrument captures both memorization and understanding in an African context, which makes it distinct from traditional instruments. Additionally, the ALQ challenges the current individualistic view of SAL by including a group dimension. Given the high psychometric quality of this new instrument, it is crucial to validate it with a large sample. Therefore, this paper discusses the validation processes and recommends the use of the ALQ for comparative purposes in the Congolese context. Further research will explore the extension of this context-specific instrument to other cultural settings and the assessment of cross-cultural validity.

Keywords: learning approaches, instrument validation, context-specific studying in group

1. Introduction

In recent decades, there has been a significant focus on students' learning activities (Fryer & Vermunt, 2018; Plevoets, 2016; Rozgonjuk et al., 2020). The seminal work by Marton and Säljö (1976, 1984) introduced the students' approaches to learning (SAL) framework, which has had a considerable impact on the literature (Hu & Yeo, 2020). This framework theorizes how individuals approach learning tasks (Biggs 1987; Biggs et al., 2001; Marton & Säljö 1976). Since then, researchers have developed questionnaires to investigate students' approaches to learning at a more general level (Biggs, 1987; Entwistle & Ramsden, 1983). The Approaches to Studying Inventory (ASI), developed in Lancaster by Entwistle and Ramsden (1983), and the Study Process Questionnaire (SPQ), developed by Biggs (1987) in Australia, are two of the most widely used and reported in the literature. Both instruments explore similar approaches, namely the deep, surface and strategic or achieving approaches.

Over time, these instruments have been adapted, and revised versions have been produced. The Approaches to Study Skills Inventory for Students (ASSIST) and the RASI were derived from the ASI (Dedos & Fouskakis, 2021; Entwistle & Ramsden, 1983; Entwistle et al., 2013; Malinakova, 2022), while the R-SPQ-2F was derived from the SPQ (Biggs et al., 2001; Pérez-de-Castro, 2020; Smarandache et al., 2022). Questionnaires used to assess SAL have originated from a dichotomous conception of deep and surface approaches (Entwistle et al., 2013; Parpala et al., 2022). However, empirical evidence from Asian and Western contexts suggests that SAL may be better represented by a continuum account of deep and surface approaches, with a range of different combinations of understanding and memorization in between (Leung et al., 2008). This perspective has been highlighted by multiple studies about students' learning profiles (Haarala-Muhonen et al., 2017; Parpala et al., 2022; Vlachopanou et al., 2022).

Furthermore, using existing instruments has not always produced expected results, as studies have reported a positive correlation between deep and surface approaches to learning, indicating that SAL may require context-specific scales (Fryer et al., 2012; Kapinga et al., 2018; Tan, 2011). The current research was confronted with this reality when the

adaptation of the R-SPQ-2F during the first step of the research, produced questionable results in terms of reliability and validity (Kapinga, 2018).

To address this issue, it was decided to develop a context-specific instrument, the Approaches to Learning Questionnaire (ALQ), was developed based on students' discourses about learning recorded during interviews. The pilot study resulted in a valid and reliable 23-items instrument that includes not only intentions and strategies, but also a combination of both understanding and memorization. Additionally, studying in groups is included as a dimension measured by the ALQ (Kapinga, 2018). Given the (di)similarities of the ALQ with traditional instruments, it is essential to make this instrument available to researchers for use in different contexts. However, the ALQ first needs to be validated with a large sample in DRCongo context, for which it was specifically constructed. This paper presents the validation of the ALQ, with findings on confirmatory factor analysis and internal consistency reported.

2. Theoretical Background

2.1 Approaches to Learning: Concept

It is often mentioned that Marton and Säljö's (1976) qualitative work on how students study an academic text resulted in the distinction between deep and surface processing levels. The former refers to comprehension, while the latter refers to memorization (Biggs, 1987). By asking students how they studied on a daily basis, the two pioneers established two approaches to learning: the deep and the surface approach, as reflecting two levels of processing (Biggs et al., 2001; Entwistle et al., 2013). Since then, the research tradition shows that the approaches to learning are a combination of students' intentions and strategies (Biggs et al., 2001; Han & Geng, 2023). Therefore, students approach a learning task according to their intentions or motives (Marton & Säljö, 1976b, 1984).

In general, researchers have distinguished three main approaches: deep approaches, surface approaches and strategic approaches (Biggs et al., 2001). Students who rely on a deep approach to learning try to understand the meaning and make connections between ideas and information, think critically, capture the logical structure underlying the content or information as well as the related source, they are able to explain the content to another student and build their own understanding of course materials and they transform the knowledge (Alt & Boniel-Nissim, 2018; Azewara et al., 2021; Hu & Yeo, 2020; Lindblom-Ylänne et al., 2019; Omar, 2021). In contrast, students who use a surface approach memorize facts without understanding them, use a minimum of effort and engagement, they passively receive ideas and concepts without questioning them and learn them by heart in order to pass a course, to meet the assessment demand, they are led by the fear of failure, motivated by a deadline (Alhammadi, 2021; Alt & Boniel-Nissim, 2018; Chue, 2022; Zilundu et al., 2022). The surface approach has been found to imply unreflective learning (Lindblom-Ylänne et al., 2019). It characterizes students who are more oriented towards obtaining a degree, a diploma, rather than acquiring expertise, mastering knowledge (Lindblom-Ylänne et al., 2019).

Students using a third approach, which has been described as an achieving or strategic approach, pay close attention to assessment requirements, organize their learning and manage their time to maximize their grades (Biggs 1987; Biggs et al, 2001; Nieminena et al, 2021). This approach combines aspects of both deep and surface approaches to achieve success (Bonsaksena & Breen-Franklin, 2023). Recent studies in Finland have described this approach as organised learning and effort management (Haarala-Muhonen et al., 2017; Lindblom-Ylänne et al., 2019). In the same context, researchers from the University of Helsinki have refined the traditional instruments and developed a new instrument called HowULearn (Herrmann et al., 2017; Lindblom-Ylänne et al., 2019; Parpala & Lindblom-Ylänne 2012; Vlachopanou et al., 2022). The questionnaire draws from previous questionnaires such as the Approaches to Learning and Studying Inventory (ALSI), the Learning and Studying Questionnaire (LSQ), and the Revised Learning Process Questionnaire (RLPQ-2F) (Entwistle et al., 2003; Herrmann et al., 2017; Kember et al., 2004; Lindblom-Ylänne et al., 2019; Parpala & Lindblom-Ylänne, 2012; Vlachopanou et al., 2022).

It is worth noting that most instruments used to assess the approaches to learning come from Western contexts and assess similar dimensions. Nevertheless, they have been refined over time in various contexts to better assess approaches to learning (Lindblom-Ylänne et al., 2019; Parpala et al., 2022).

2.2 Approaches to Learning and Context

Many studies have been conducted worldwide to assess the relationship between SAL and its determinants (Coertjens et al., 2016; Sarpon et al., 2020). Personal variables, such as age, gender, previous approaches, and performance, and contextual factors, such as teaching approaches, teacher, assessment, and course materials, have been distinguished by researchers as influencing SAL (Fryer &Vermunt, 2018; Rozgonjuk et al., 2020). Personal variables have a direct impact on SAL, while contextual factors generally act through students' perceptions (Postareff et al., 2018). Therefore, SAL is considered as a context-dependent variable.

SAL is related to both change and stability (Lietz & Matthews, 2010; Varunki et al., 2017; Zilundu et al., 2022). For example, Postareff et al (2018) considered the strategic approaches to be stable, while both deep and surface approaches to learning are highly variable at the individual level. In contrast, Lietz and Matthews (2010) pointed to stability in case of similarities with respect to the contexts, the task perceptions and assessment demands. Zilundu et al (2022) provided a balanced view, considering SAL as modifiable, as flexible or adaptable to the task, despite its potential stability (Delgado et al., 2018; Zilundu et al., 2022).

SAL variations are related to different variables, as described above. Moreover, SAL appears also to be a context-specific variable, showing variation across contexts and cultures (Zilundu et al., 2022). SAL as sensitive to culture have attracted researchers' attention (Bonsaksen et al., 2017; Bonsaksen et al., 2020; Brown et al., 2017; Zilundu, 2022). For example, Brown et al (2017) compared the ASSIST scores of students from Australia, Hong Kong, Norway and Singapore. They assessed the significance of the difference between the mean scores of the four groups using a one-way analysis of variance (ANOVA). They found significant differences between Australia and Hong Kong, and between Hong Kong and Norway in relation to surface approaches. They also found a significant difference between Australia and the other countries in terms of strategic approaches. However, no significant difference was found between the four countries on deep approaches.

Differences between cultures were also noticed in studies concerning relationships between SAL and performance (Bonsaksen et al., 2020). Bonsaksen et al (2020) examined the ASSIST scores of students from the four countries mentioned above and their grade point averages (GPA). The results showed that low scores on deep approaches and high scores on strategic approaches were associated with high GPA within the Hong Kong group, while high scores on strategic approaches and lower scores on surface approaches were associated with higher GPA. However, between the Australian and Singaporean samples, as well as when considering the total sample, no relationship was found between SAL and their GPA. Conversely, Bonsaksen et al (2017), considering the sample from the four countries together, indicated that students' scores on 5 out of 13 ASSIST dimensions were associated with their GPA. This suggests that SAL, as well as its relationships with learning outcomes, can vary across contexts.

Variation and stability across cultural contexts was also found in the study of the factor structure of ASSIST across cultural samples from the same countries (Bonsaksen et al., 2019). Bonsaksen et al. (2019) confirmed the 3-factor structure of the questionnaire, while they also noticed quite a difference between the structure emerging from the Australian and Hong Kong samples.

Based on the diversity of findings evoked here, it can be assumed that the instruments as well as the conceptualization of approaches in terms of deep, surface, strategic or achieving may not be universal (Richardson, 2004). SAL and its relationship to academic achievement may vary across contexts. In addition, SAL can be influenced by culture, which may reinforce or discourage aspects of SAL (Zilundu et al., 2022). Furthermore, findings in relation to a positive correlation between deep and surface approaches scales revealed the complementarity of both approaches to learning (Fryer et al., 2012; Kapinga et al., 2017).

Recent studies in Asian contexts have revealed the emergence of intermediate approaches apart from deep and surface approaches (Fryer & Vermunt, 2018; Parpala et al., 2022; Richardson, 2004). Some studies in the 1990s, showed that Asian students used both deep and surface approaches to learning either together or in stages (Parpala et al., 2022). They referred to this combination as narrow approaches (Parpala et al., 2022). In the same line, Chinese learners have been perceived as rote learners who rely on memorization. On the other hand, they succeeded better than their western counterparts in international tests. This led to questioning the relationship between memorization and understanding which were thought to be mutually exclusive (dichotomous view). Empirical findings revealed that Asian students outperformed the Western because they relied on both understanding and memorizing (Kember, 2016).

Studies from a person-orientated perspective (cluster analysis) have attempted to capture these combinations through different student learning profiles (Chue, 2022; Karagiannopoulou, 2022). A learning profile describes the extension to which students rely on the combination of aspects of different approaches to learning (deep, surface and strategic approaches) (Chue, 2022). From such a combination, two main components have been distinguished considering scores on both deep and surface approaches: the consonant approaches (high deep + low surface and low deep + high surface) and dissonant approaches (high deep + high surface and low deep + low surface) (Parpala et al., 2022). Consonance refers to what is consistent with the theory, whereas dissonance refers to the combinations that are not expected between surface, deep and achieving or strategic approaches (Haarala-Muhonen et al., 2017; Parpala et al., 2022). Entwistle et al (2013) showed that students who scored high on both deep and surface approaches had dissonant approaches to learning (Entwistle et al., 2013, Parpala et al., 2022).

The impact of students' learning profiles on their learning outcomes has also been studied (Asikainen et al., 2020; Tuononen et al., 2023; Yin et al., 2023). For example, the combination of deep and achieving approaches has been found to be associated with better outcomes (Karagiannopoulou et al., 2020; Lindblom et al., 2018; Vlachopanou et al., 2022), while the opposite is true for the combination of high scores on deep and low scores on organized approaches (Haarala-Muhonen et al., 2017). Nevertheless, Chue and Nie, (2017) showed that there was no difference in terms of intrinsic motivation between students who scored high vs high and high vs low on deep and surface approaches respectively. Similarly, it was shown that students with a deep-organized profile were more successful than those with a surface-unorganized profile (Vlachopanou et al., 2022).

Taken together, the aforementioned findings reveal the complexity of the relationships between different approaches to learning. Therefore, further exploration is needed to understand the continuum of approaches to learning and broaden the understanding of SAL across different contexts (Chue, 2022; Kember, 2016).

In the African English-speaking context, studies have mostly focused on medical students using different versions of the ASI or SPQ, which produced similar results with respect to the dominant approaches (Khine et al., 2019; Kidane et al., 2020; Zilundu et al., 2022). However, no context-specific instruments have been developed. In French-speaking Africa, studies on SAL are rare. In DRCongo, for instance, the R-SPQ-2F was validated in the first step of the current research (Kapinga et al., 2018). Only after deleting a total of 6 items from the original 20 items, the reliability of the main deep and surface scales was found to be acceptable (.64 and .65). Given that the SAL vary across cultural settings, the results suggested that Congolese students might approach learning in a different way than characterized by the instrument (Marambe et al., 2012). The development of the Approaches to Learning Questionnaire (ALQ) was initiated as a pilot study to address the variations in SAL across cultural settings.

Significant gaps exist in the literature regarding the measurement of intermediate approaches to learning, despite the availability of empirical evidence (Fryer et al., 2012; Kapinga et al., 2018). In fact, apart from the work by Tan (2011), who added a culturally sensitive scale, 'understanding and memorizing scale' to some items of the SPQ and R-SPQ-2F to produce the Malaysian version of the SPQ, to our knowledge, there are no other scales developed with this purpose. Moreover, relying solely on Western questionnaires to study learning approaches may not capture the particularities arising from different contexts (Lindblom-Ylänne et al., 2019). There is a critical need for (context-specific) instruments to assess SAL (Kapinga et al., 2018; Parpala et al., 2022).

To address this need, the authors developed the Approaches to Learning Questionnaire (ALQ) during a pilot study in DRCongo (Kapinga, 2018). The ALQ captures the intermediate approach to learning that balances memorization and understanding, and it also recognizes studying in a group as a distinct approach to learning (Kapinga, 2018; Tan, 1993). The pilot study demonstrated that the ALQ consists of four scales that measure studying in a group, elaborative studying, studying by testing, and receptive studying. As a robust and valid instrument for assessing SAL, the current paper seeks to examine the psychometric properties of the ALQ using a large sample from Université de Kinshasa (UNIKIN) and Université Catholique du Congo (UCC). Specifically, the paper aims to determine if the factor structure of the ALQ remains consistent in a larger sample size.

3. Method

3.1 Overall Design

This aim of this study is to validate the ALQ through confirmatory factor analysis, focusing on testing the instrument's validity and reliability. The validity refers to the ability of an instrument to measure what it is intended to measure, while reliability relates to its capacity to produce consistent results in similar conditions (Field, 2009; Herrmanna et al., 2017). To this end, the goodness of model fit and the Cronbach's alpha coefficient are calculated.

3.2 Participants

The ALQ was administered to 463 students from the University of Kinshasa (UNIKIN) and the Catholic University of Congo (UCC). The UNIKIN group (N=374) comprised first-year students in Management (N=258) and Political Science (N=116). The UCC group (N=89) comprised 40 first-year political science students and 49 second-year Communication Science students.

3.3 Instrument

The ALQ was used to collect data. As mentioned earlier, the ALQ was recently developed in DRCongo context (Kapinga, 2018). The ALQ is composed of 23 items that constitute the 4 scales: studying in group (SG) (N=10, α=.94), elaborative studying (ES) (N=5, α=.88), studying by testing (ST) (N=5, α=.86) and receptive studying (RS) (N=3, α=.82). Sample items are "To understand the content, we meet each other and solve exercises" (SG), "To understand

and memorize, I synthesize materials" (ES), "To make sure that I memorized well the content, someone asks me questions" (ST) and "To understand and memorize, I simply read materials" (SR). All these translated items were written in French, Congolese official and schooling language. The full questionnaire in French, may be provided if requested. Responses were collected on a 5-point Likert-type scale ranging from 1 (this item never applies to me) to 5 (this item always applies to me). The ALQ items are based on students discourses in relation to their learning (Kapinga et al., 2018).

3.4 Procedure

The administration of the questionnaire took place between March and June 2016 after receiving an agreement from the local ethical boards. Three assistants supervised the process during course time at UNIKIN and UCC. The supervisors explained the aim as well as the value of students contribution to the research. Students who were willing to fill the questionnaire were asked to stay in the classroom while those who were not willing were asked to leave until the end of the process. The students simultaneously answered six background questions (name, gender, field of study and grade point from secondary school, year of study, faculty). As there was no time limit, the entire completion process took less than an hour.

3.5 Data Analysis

AMOS software was used to test model fit, while SPSS 2021 supported scale reliability assessment and the descriptive data analysis.

3.5.1 Confirmatory Factor Analysis: Goodness of Fit Test

The pilot study has provided the structure of the ALQ (Kapinga, 2018). To test an existing structure, a confirmatory factor analysis is appropriate (Field, 2009). Two models were tested (Jackson et al., 2009). The first, a unidimensional model in which all 23 items were grouped into one factor, inspired by some correlations between ALQ dimensions. The second, a four-factor model was based on the structure of the four scales that emerged from the pilot study (studying in group, studying by testing, elaborative studying and receptive studying) (Kapinga, 2018).

The goodness of fit between the two hypothesized models and the data was assessed using a two-index presentation strategy, combining the Standardized Root Mean Square Residual (SRMR) and the Comparative Fit Index (CFI) to control for type 1 and type 2 errors (Hu & Bentler, 1999). The maximum likelihood (ML) was used to assess both models, as recommended (Biggs et al., 2001). The results are displayed in Table 1.

Table 1. Adjustment of data to models

Models	SRMR	CFI	Conclusion
1 factor model	.16	.55	Poor
4 factor model	.08	.90	Acceptable

Table 1 displays the model fit indices for the 1-factor and 4-factor models. The first model had a SRMR of .16, which is above the recommended cutoff value (SRMR< .08 and CFI > .95) (Hu & Bentler, 1999), and a CFI of .55, which is below the conventional cutoff value of .95 (Hu & Bentler, 1999; Marsh et al., 2004). Therefore, the 1-factor model did not adequately fit the data. The second or 4-factor model had a CFI of .90, which is acceptable based on the conventional cutoff value of Marsh et al. (2004), but still below the conventional cutoff value of .95 recommended by Hu and Bentler (1999). The SRMR value (.08) was above the norm recommended by Hu and Bentler (1999). Therefore, additional modifications were needed to improve the model fit.

Naturally, to revise the model, several statistical considerations were taken into account, including modification indices proposed by AMOS, residual covariances, factor loading and the confrontation of the results with the theoretical data (Hu & Bentler, 1999). For example, a high value of standardized residual covariances (> 8) was observed between two items: Appr28 (To make sure that I have well memorized, someone asks me questions) and Appr45 (To make sure that I have well understood and memorized, someone asks me questions) on the one hand, and between each of these items and many others on the other hand. To address this issue, the covariance between the error terms of these two items (Appr28 and Appr45) was added. However, this modification did not improve the SRMR index, and both items had low factor loading values, so they were deleted (Brown, 2015). The two items assessing studying by testing (Appr28 and Appr45) had some unique characteristics compared to the other three items in the same scale. Specifically, these two items assessed testing with the involvement of a third person, whereas the other three items referred to individual assessment. This could lead to confusion between studying by testing and studying in

group scales. Therefore, these items were removed from the scale. Overall, the revised model resulted in improved fit indices, as shown in Table 2.

Table 2. Adjustment after revision of the 4 factors model

Model	SRMR	CFI	Conclusion
4 factor model	.05	.96	Perfect

Upon examination of the indices values in Table 2, it can be observed that the goodness of fit has significantly improved (SRMR= .05 et CFI= .96). Hence, it can be concluded that the 4-factor model provides a good fit to the data based on the conventional criteria (SRMR < .08 and CFI > .95) (Hu & Bentler, 1999). Moreover, all covariances are positive and statistically significant (p = .001). This finding is consistent with both the estimates and factor loadings. It is noteworthy that all the standardized residual covariances are below the conventional value of 2.58 (Brown, 2015), with the exception of two pairs of studying in group items: Appr12 (To understand the content, we meet and solve exercises) and Appr13 (To understand, we meet and explain the course materials) (CRs = 3. 61) and items Appr46 (To make sure that we have all understood and memorized, we solve the past exam questions) and Appr29 (To make sure that we have all memorized well, we solve the past exam questions) (CRs = 3.05).

It may be questioned why covariances were not added to the error terms of the aforementioned items despite their similarities (Cole et al., 2007). However, since all four items had positive loadings, contributed to the factor explanation, and their residual covariance values (CRs) could be influenced by the large sample size (Brown, 2015), it was decided not to modify their error terms and to report the (CRs) values. Moreover, including excessive covariances in a confirmatory model is not recommended (Cortina, 2002).

The following Figure shows the final model resulting from the CFA.

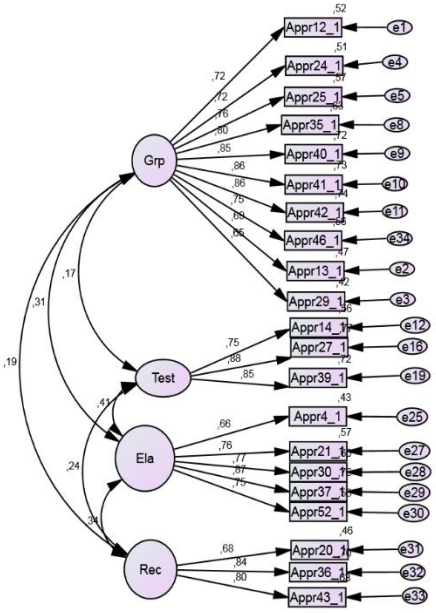

Figure 1. Confirmatory model ALQ

Note. Grp = Studying in group. Test = Studying by testing. Ela = Elaborative studying. Rec = Receptive studying

Overall, the process confirmed that the ALQ is an instrument of 4 factors measuring studying in group (10 items), elaborative studying (5 items), studying by testing (3 items), and receptive studying (3 items). It should be remembered that the studying by testing scale lost 2 items during the confirmatory factor analysis process.

3.5.2 Internal Consistency of Scales and Descriptive Statistics

The Cronbach alpha coefficient was used to assess the internal consistency of the scales from the revised model. Table 3 displays the descriptive statistics (Means, Std. Deviation and number of items) and alpha of Cronbach's values.

Table 3. Means, StD Deviation and alpha of Cronbach coefficient

Scales	Means	Std. Deviation (SD)	α	Items (N)
Studying in group	36.60	11.12	.94	10
Elaborative Studying	18.08	5.99	.88	5
Studying by testing	9.23	4.12	.86	3
Receptive Studying	10.93	3.69	.82	3

The results in the table 3 indicate that the Cronbach's alpha values for all four scales are above the conventional .70 (Field, 2009). Thus, the ALQ is a reliable instrument for assessing SAL in the Congolese context (Field, 2009; Tavakol & Dennick, 2011). The mean values suggest that students rely more on studying in a group and elaborative studying than on testing and receptive studying approaches.

3.6 Discussion

The results of the confirmatory factor analysis have confirmed that the ALQ is a valid instrument to assess SAL in a Congolese context. Each of the four dimensions of the ALQ assesses SAL in an original conceptualization as a combination of both intentions and strategies (Chue, 2021; Han & Geng, 2023; Zilundu et al., 2022). In the ALQ, however, a strategy is included in each item as a companion to an intention. Moreover, the ALQ is grounded in students' discourses about their learning. In this respect, three different intentions (to understand, to memorize, and both to memorize and to understand) are considered. ALQ differs from existing instruments by combining both intentions to understand and to memorize within items and also by investigating studying in group as a specific approaches to learning.

The ALQ scales (studying in groups, elaborative studying, studying by testing, and receptive studying) are strongly rooted in the literature (Aku et al. 2022; Kapinga, 2018). In fact, among the activity-based learning strategy of teaching, collaborative learning has been mentioned as enhancing learning, improving students' learning outcomes, enhancing students' retention ability, fostering deep cognitive thinking and stimulating students' engagement (Aku et al. 2022 ; Chika, 2019; Dearnley et al., 2018; Lahdenperäa et al., 2023; Masila, 2022; Sarpong et al., 2020). Indeed, discussions among members and peer interactions within groups promote students learning and engagement (Alhammadi, 2021; Wijaya et al., 2022). So, the benefits of studying in a group are well recognized as they were also emphasized by the tenants of student-centered approaches to teaching who consider that studying in a group or collaborative learning entails deep approaches to learning (Azewara et al., 2021). In this sense, based on the skills developed by studying in a group as a teaching approach, this ALQ dimension may be linked to classical deep approaches. On the other hand, given the organizational aspect that studying in group implies, it may be closer to classical strategic approaches. Further research will analyze such relations. Further studies are needed to answer the Tang (1993) call for empirical research on studying in group as approaches to learning. Interestingly, these findings corroborate Tang's view of SAL by integrating a group dimension. In this perspective, the major contribution of the paper is also theoretical.

Elaborative learning is not considered as an approach to learning in current times. However, the concept of elaboration appeared in the literature relating to students learning strategies (Endres et al., 2017; Schweder et al., 2019). For instance, it has been shown that elaborative strategies enhance students understanding (Endres et al., 2017). It is also acknowledged that elaborative strategies relate to effort and perceptions of teacher mastery goal (Schweder et al., 2019). In effect, elaborative strategies constitute major strategies in deep learning as they relate to an integration of new knowledge into activated prior knowledge (Endres et al., 2017; Schweder et al., 2019). Thus, in the case of SAL, especially in relation to ALQ, elaborative approaches to studying emphasize strategies such as summarizing, synthesizing the content in order to get a general and broader picture with three different intentions

(Kapinga, 2018). In this respect, elaborative studying seem to be linked to classical deep approaches to learning, since they both involve making connections between ideas and getting an entire meaningful (Delgado et al., 2018). Further research is needed to explore the relationship between these two approaches in more depth.

Studying by testing is a new concept in the field of SAL, but it is widely recognized that questions play a crucial role in the teaching and learning process by stimulating learners thinking (Wijaya et al., 2022). Additionally, the 'testing effect' has been shown as an effective teaching strategy that enhances learning by increasing recall (Jensen et al., 2020). Indeed, the monitoring of knowledge through testing is a well-established method to enhance learning (Wijaya et al., 2022). When it comes to ALQ dimensions, studying by testing refers to student assessment of their own knowledge to support understanding, memorizing or both (Kapinga, 2018). In this way, studying by testing may be linked to deep approaches to learning. Naturally, further research is needed to examine this assumption, as studying by testing involves both understanding and memorizing intentions.

Receptive studying as one of the dimensions of ALQ is characterized by simple reading for understanding, memorizing or a combination of both, which helps students gain a general idea or recall what they have already learned (Kapinga, 2018). The concept is not directly linked to traditional SAL concepts, but in language learning, receptive vocabulary refers to passive vocabulary, while productive vocabulary refers to active vocabulary (Maskor et al., 2016). Of course, the passivity seems to be the major characteristic of the receptive studying as students rely on this approach without any effort regardless the intentions. From this, the receptive approaches to learning may be seen as related to the traditional surface approaches to learning to some extent (Parpala et al., 2022). However, the intention to understand as well as the intention to both understand and memorize suggest that receptive studying constitutes a distinct approach (Kapinga, 2018). Further research could explore this hypothesis.

With respect to reliability, the current study has demonstrated higher Cronbach alpha values (studying in group .94, elaborative studying .88, studying by testing .86 and receptive studying .82) compared to the results of the pilot study (.93, .87, .83 and .79). Overall, the CFA and internal consistency results have confirmed that the ALQ is a valid instrument that can be used in its current form with four factors. Specifically, the instrument consists of 10 items assessing studying in group, 5 items assessing elaborative studying, 3 items assessing studying by testing and 3 items assessing receptive studying.

The present study has provided not only a context-specific (based on Congolese students discourses on learning) but also a context-flexible instrument for assessing SAL. In other words, the conceptualization of approaches to learning within the ALQ is not limited to Congolese students, as it is deeply embedded in the literature and therefore seems meaningful at a general level (Kapinga, 2018). However, it is essential to assess the meaningfulness of the ALQ by collecting how students interpret each of its dimensions in a variety of contexts. With this in mind, the next study will focus on administering the ALQ to students in another country.

This study suggests a new perspective regarding the conceptualization of learning approaches (Parpala et al., 2022). Most previous efforts to address SAL have been based on an individualistic viewpoint, but the results of this study point to the integration of a social perspective by reconsidering learning in groups as a specific approach (Aku et al., 2022; Kapinga, 2018; Masila, 2022; Tang, 1993). In this way, learning approaches also represent the learning intentions and strategies of a group of students (Kapinga, 2018).

4. Conclusion

The dimensions of the ALQ are based on crucial concepts that have been used and are still being explored in the higher education literature. These concepts have a well-established history in terms of their role and contribution to learning in general and to teaching-learning processes and learning outcomes in particular. However, there is still a need to investigate these concepts through the SAL prism. Therefore, this study attracts the attention of researchers by explicitly integrating these concepts into the SAL field. The present work has validated a context-specific instrument, the ALQ, in the context of its construction. The results suggest the need to expand the use of the ALQ. Further studies could focus on testing such an instrument in a variety of contexts and countries.

Acknowledgements

This research was supported by grants from the VLIR UOS fund (KU Leuven). We are grateful to teacher assistants from UNIKIN and UCC who have facilitated data collection at both institutions. Thanks to all students who have accepted to fill out the questionnaire.

Conflict of Interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

References

Aku, P. E., Hussaini, P. S., & Gabi, S. S. (2022). Effect of collaborative learning strategy on students' attitude and achievement in energy in nasarawa state, nigeria. *African Journal of Humanities and Contemporary Education Research, 3*(2), 101‐109. https://publications.afropolitanjournals.com/index.php/ajhcer/article/view/78

Alhammadi, S. (2021). The effect of the covid-19 pandemic on learning quality and practices in higher education-using deep and surface approaches. *Education Sciences, 11*(9), 1-13. https://doi.org/10.3390/educsci11090462

Alt, D., & Boniel-Nissim, M. (2018). Links between adolescents' deep and surface learning approaches, problematic internet use and fear of missing out (FoMO). *Internet Interventions, 13*, 30-39. https://doi.org/10.1016/j.invent.2018.05.002

Asikainen, H., Salmela-Aro, K., Parpala, A., & Katajavuori, N. (2020). Learning profiles and their relation to study-related burnout and academic achievement among university students. *Learning and Individual differences, 78*, 101781. https://doi.org/10.1016/j.lindif.2019.101781

Azewara, M. A., Agyeman, E. P., Dawson-Ahmoah, J., Adusei, A., & Twum-Ampofo, E. (2021). Students' approaches to learning the new B. Ed. programme in Ghana: evidence from colleges of education within Mampong municipality. *Social Education Research, 2*(2), 278-288. https://doi.org/10.37256/ser.222021914

Biggs, J. B. (1987). *Student approaches to learning and studying.* Melbourne: Australian Council for Educational Research.

Biggs, J., Kember, D., & Leung, Y.P. (2001). The revised two-Factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology, 71*, 133-149. https://doi.org/10.1348/000709901158433

Bonsaksen, T., Brown, T., Lim, H. B., & Fong, K. (2017). Approaches to studying predict academic performance in undergraduate occupational therapy students: A cross-cultural study. *BMC Medical Education, 17*, 1-9. https://doi.org/10.1186/s12909-017-0914-3

Bonsaksen, T., Småstuen, M. C., Thørrisen, M. M., Fong, K., Lim, H. B., & Brown, T. (2019). Factor analysis of the approaches and study skills inventory for students in a cross-cultural occupational therapy undergraduate student sample. *Australian Occupational Therapy Journal, 66*(1), 33-43. https://doi.org/10.1111/1440-1630.12504

Bonsaksena, T., & Breen-Franklin, A. (2023). Intrinsic relationships between learning conceptions, preferences for teaching and approaches to studying among occupational therapy students in the united states. *Occupational Therapy in Health Care, 37*(2), 197-209. https://doi.org/10.1080/07380577.2022.2025512

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). New York, NY: Guilford.

Brown, T., Fong, K. N., Bonsaksen, T., Lan, T. H., Murdolo, Y., Gonzalez, P. C., & Beng, L. H. (2017). Approaches to learning among occupational therapy undergraduate students: A cross-cultural study. *Scandinavian Journal of Occupational Therapy, 24*(4), 299-310. https://doi.org/10.1080/11038128.2016.1229811

Chika, U. (2019). Activity-based learning strategies and academic achievement of social studies students in Obio/Akpor local government area. *International Journal of Education and Evaluation, 5*(1), 19-24.

Chue, K. L. (2022). Using the Rasch model to examine pre-service teachers approach to learning profiles. *Methodological Innovations, 15*(1), 86-95. https://doi.org/10.1177/20597991221077908

Chue, K. L., & Nie ,Y. (2017). Study orchestrations and motivational differences in a mathematical context. *Learning and Individual differences, 57*, 77-84. https://doi.org/10.1016/j.lindif.2017.06.002

Coertjens, L., Vanthournout, G., Lindblom-Ylänne, S., & Postareff, L. (2016). Understanding individual differences in approaches to learning across courses: A mixed method approach. *Learning and Individual Differences, 51*, 69-80. https://doi.org/10.1016/j.lindif.2016.07.003

Cole, D. A., Ciesla, J. A., & Steiger, J. H. (2007). The insidious effects of failing to include design-driven correlated residuals in latent-variable covariance structure analysis. *Psychological Methods, 12*(4), 381-398. https://doi.org/10.1037/1082-989X.12.4.381

Cortina, J. (2002). Big things have small beginnings: An assortment of 'minor' methodological misunderstandings. *Journal of Management, 28*, 339-262. https://doi.org/10.1016/S0149-2063(02)00131-9

Dearnley, C., Rhodes, C., Roberts, P., Williams, P., & Prenton, S. (2018). Team-based learning in nursing and midwifery higher education; a systematic review of the evidence for change. *Nurse Education Today, 60*, 75-83. https://doi.org/10.1016/j.nedt.2017.09.012

Dedos, S. G., & Fouskakis, D. (2021). Dataset and validation of the approaches to study skills inventory for students.

Scientific Data, 8(1), 158. https://doi.org/10.1038/s41597-021-00943-6

Delgado Á.H, Almeida J.P, Mendes L.S, Oliveira IN, Ezequiel O.D, Lucchetti A.L, & Lucchetti G. (2018). Are surface and deep learning approaches associated with study patterns and choices among medical students? A cross-sectional study. *Sao Paulo Med J, 136*, 414-420. https://doi.org/10.1590/1516-3180.2018.0200060818

Endres, T., Carpenter, S., Martin, A., & Renkl, A. (2017). Enhancing learning by retrieval: Enriching free recall with elaborative prompting. *Learning and Instruction, 49*, 13-20. https://doi.org/10.1016/j.learninstruc.2016.11.010

Entwistle, N., McCune, V., & Hounsell, J. (2003). *Investigating ways of enhancing university teaching-learning environments: Measuring students' approaches to studying and perceptions of teaching. In Powerful learning environments: Unravelling basic components and dimensions* (pp. 89-108). Elsevier Science Limited.

Entwistle, N., McCune, V., & Tait, H. (2013). *Approaches and study skills inventory for students* (ASSIST)(incorporating the Revised Approaches to Studying Inventory-RASI). Edinburgh: Centre for Research on Learning and Instruction, University of Edinburgh.

Entwistle, N. J., & Ramsden, P. (1983). *Understanding student learning*. London: Croom Helm.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Los Angeles: Sage Publications.

Fryer, L. K., Ginns, P., Walker, R. A., & Nakao, K. (2012). The adaptation and validation of the CEQ and the R-SPQ-2F to the Japanese tertiary environment. *Educational Psychology, 82*(4), 549-563. https://doi.org/10.1111/j.2044-8279.2011.02045.x

Fryer, L. K., & Vermunt, J. D. (2018) . Regulating approaches to learning: Testing learning strategy convergences across a year at university. *British Journal of Educational Psychology, 88*(1), 21-41. https://doi.org/10.1111/bjep.12169

Haarala-Muhonen, A., Ruohoniemi, M., Parpala, A., Komulainen, E., & Lindblom-Ylänne, S. (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. https://doi.org/10.1007/s10734-016-0087-8

Han, J., & Geng, X. (2023). University students' approaches to online learning technologies: The roles of perceived support, affect/emotion and self-efficacy in technology-enhanced learning. *Computers & Education, 194*, 1-14. https://doi.org/10.1016/j.compedu.2022.104695

Herrmanna, K. J., Bager-Elsborgaand, A., & Parpala, A. (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. https://doi.org/10.1080/00313831.2016.1172497

Hu, L-T., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55. https://doi.org/10.1080/10705519909540118

Hu, X., & Yeo, G.B. (2020). Emotional exhaustion and reduced self-efficacy: The mediating role of deep and surface learning strategies. *MotivEmot, 44*, 785-795. https://doi.org/10.1007/s11031-020-09846-2

Jackson, D. L., Gillaspy, J.A., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis. *Psychological Methods, 14*(1), 6-23. https://doi.org/10.1037/a0014694

Jensen, J. L., McDaniel, M. A., Kummer, T. A., Godoy, P. D., & Clair, B. (2020). Testing effect on high-level cognitive skills. *CBE-Life Sciences Education, 19*(3), 1-10. https://doi.org/10.1187/cbe.19-10-0193

Kapinga-Mutatayi, M., Elen, J., & Mukendi Wa Mpoyi, P. (2017, September). *Considering context in constructing an instrument assessing students' approaches to learning.* [Paper presentation]. EARLI 2017, Tampere, Finland. https://doi.org/10.1016/S0959-4752(17)30280-3

Kapinga Mutatayi, M. (2018). *Le travail de l'étudiant. A la croisée des approches et des représentations.* [Unpublished doctoral dissertation). Katholieke Universiteit Leuven.

Kapinga - Mutatayi, M., Mukendi, P., & Elen, J. (2018). Students' approaches to learning: Validating study processes questionnaire for use in Congolese setting. *Journal of Advances in Education Research, 3*(2), 109-120. https://doi.org/10.22606/jaer.2018.32005

Karagiannopoulou, E., Milienos, F. S., Kamtsios, S., & Rentzios, C. (2020). Do defense styles and approaches to learning 'fit together' in students' profiles? Differences between years of study. *Educational Psychology, 40*(5), 570-591. https://doi.org/10.1080/01443410.2019.1600661

Karagiannopoulou, E., Milienos, F. S., & Rentzios, C. (2022). Grouping learning approaches and emotional factors to predict students' academic progress. *International Journal of School & Educational Psychology, 10*(2), 258-275.

https://doi.org/10.1080/21683603.2020.1832941

Kember, D. (2016). Why do Chinese students out-perform those from the West? Do approaches to learning contribute to the explanation? *Cogent Education, 3*(1), 1248187. https://doi.org/10.1080/2331186X.2016.1248187

Khine A. A, Adefuye, A.O., & Busari, J. (2019). Utility of concept mapping as a tool to enhance metacognitive teaching and learning of complex concepts in undergraduate medical education. *Arch Med Health Sci, 7*, 267-272. https://doi.org/10.4103/amhs.amhs_165_19

Kidane H. H, Roebertsen, H., & Van der Vleuten, C.P.M. (2020). Students' perceptions towards self-directed learning in Ethiopian medical schools with new innovative curriculum: A mixed-method study. *BMC Medical Education, 20*(1), 1-10. https://doi.org/10.1186/s12909-019-1924-0

Lahdenperäa, J., Rämöaand, J., & Postareff, L. (2023). Contrasting undergraduate mathematics students' approaches to learning and their interactions within two student-centred learning environments. *International Journal of Mathematical Education in Science and Technology, 54*(5), 687-705. https://doi.org/10.1080/0020739X.2021.1962998

Leung, D.Y.P, Ginns, P., & Kember, D. (2008). Examining the cultural specificity of approaches to learning in universities in Hong Kong and Sydney. *Journal of Cross-Cultural Psychology, 39*(3), 251-266. https://doi.org/10.1177/0022022107313905

Lindblom-Ylänne, S., Parpala, A., & Postareff, L. (2019). What constitutes the surface approach to learning in the light of new empirical evidence?. *Studies in Higher Education, 44*(12), 2183-2195. https://doi.org/10.1080/03075079.2018.1482267

Malinakova, H. C. (2022). Assessment of students' study approaches in the first semester of organic chemistry: patterns of evolution diverge according to students' achievement level. *Journal of Chemical Education, 99*(8), 2787-2797. https://doi.org/10.1021/acs.jchemed.1c01260

Marambe, K. N., Vermunt, J. D., & Boshuizen, H. P. A. (2012). A cross-cultural comparison of student learning patterns in higher education. *Higher Education, 64*(3), 299-316. https://doi.org/10.1007/s10734-011-9494-z

Marsh, H. W, Hau, K. T, & Wen, Z. I. (2004). Comment on hypothesis testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's findings. *Structural Equation Modeling, 11*, 320-341. https://doi.org/10.1207/s15328007sem1103_2

Marton, F., & Säljö, R. (1976). On qualitative differences in learning outcome as a function of the learner's conception of the task. *British Journal of Educational Psychology, 46*(2), 115-127. https://doi.org/10.1111/j.2044-8279.1976.tb02304.x

Marton,F., & Säljö, R. (1984). Approaches to learning. In F. Marton, D. Hounsell, & N. Entwistle (Eds.), *The experience of learning* (pp. 39-58). Edinburgh: Scottish Academic Press.

Masila, J. N. (2022). *Academic engagement and learning approaches as predictors of academic achievement among form three students in Machakos county, Kenya*. [Unpublished doctoral dissertation]. Kenyata University.

Maskor, Z. M., & Baharudin, H. (2016). Receptive vocabulary knowledge or productive vocabulary knowledge in writing skill, which one important. *International Journal of Academic Research in Business and Social Sciences, 6*(11), 261-271. https://doi.org/10.6007/IJARBSS/v6-i11/2395

Nieminena, J.H., Asikainen, H., & Rämö, J. (2021). Promoting deep approach to learning and self-efficacy by changing the purpose of self-assessment: a comparison of summative and formative models. *Studies in higher education, 46*(7), 1296-1311. https://doi.org/10.1080/03075079.2019.1688282

Omar, N. (2021). Effect of learning approaches on the academic profile of fourth year undergraduate students of a private medical college. *The Professional Medical Journal, 28*(04), 580-584. https://doi.org/10.29309/TPMJ/2021.28.04.4488

Richardson, J.T.E. (2004). Methodological issues in questionnaire-based research on student learning in higher education. *Educational Psychology Review, 16*, 347-358. https://doi.org/10.1007/s10648-004-0004-z

Parpala, A., & Lindblom-Ylänne, S. (2012). Using a research instrument for developing quality at the university. *Quality in Higher Education, 18*(3), 313-328. https://doi.org/10.1080/13538322.2012.733493

Parpala, A., Mattsson, M., Herrmann, K. J., Bager-Elsborg, A., & Hailikari, T. (2022). Detecting the variability in student learning in different disciplines a person-oriented approach. *Scandinavian Journal of Educational Research, 66*(6), 1020-1037. https://doi.org/10.1080/00313831.2021.1958256

Pérez-de-Castro, A. (2020). Study approaches of life science students using the revised two-factor study process questionnaire (R-SPQ-2F). *Education Sciences, 10*(7), 173. https://doi.org/10.3390/educsci10070173

Plevoets, M. (2016). *Etudier et vivre à l'université : guide de l'étudiant*. Kinshasa : Médiaspaul.

Postareff, L., Mattsson, M., & Parpala, A. (2018). The effect of perceptions of the teaching-learning environment on the variation in approaches to learning-between-student differences and within-student variation. *Learning and Individual Differences, 68*, 96-107. https://doi.org/10.1016/j.lindif.2018.10.006

Rozgonjuk, D., Kraav, T., Mikkor,K., Orav-Puurand, K., & Täht, K. (2020). Mathematics anxiety among STEM and social sciences students: the roles of mathematics self-efficacy, and deep and surface approach to learning. *International Journal of STEM Education, 7*(46), 1-11. https://doi.org/10.1186/s40594-020-00246-z

Sarpong, T., Sarpong, F., & Asor, A. (2020). The influence of activity-based teaching method used in teaching social studies on students retention and academic performance: A quasi-experimental study of selected junior high school students in Sekyere south district of Ashanti region, Ghana. *Open Journal of Social Sciences, 8*, 238-254. https://doi.org/10.4236/jss.2020.812018

Schweder, S., Raufelder, D., Kulakow, S., & Wulff, T. (2019). How the learning context affects adolescents' goal orientation, effort, and learning strategies. *The Journal of Educational Research, 112*(5), 604-614. https://doi.org/10.1080/00220671.2019.1645085

Smarandache, I. G., Maricutoiu, L. P., Ilie, M. D., Iancu, D. E., & Mladenovici, V. (2022). Students' approach to learning: evidence regarding the importance of the interest-to-effort ratio. *Higher Education Research & Development, 41*(2), 546-561. https://doi.org/10.1080/07294360.2020.1865283

Tan, P-L. (2011). Towards a culturally sensitive and deeper understanding of "rote learning" and memorization of adult learners. *Journal of Studies in International Education, 15*(2), 124-145. https://doi.org/10.1177/1028315309357940

Tang, K.C.C. (1993). Spontaneous collaborative learning: A new dimension in student learning experience? *Higher Education Research and Development, 12*(2), 115-130. https://doi.org/10.1080/0729436930120201

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53-55. https://doi.org/10.5116/ijme.4dfb.8dfd

Tuononen, T., Hyytinen, H., Räisänen, M., Hailikari, T., & Parpala, A. (2023). Metacognitive awareness in relation to university students' learning profiles. *Metacognition and Learning, 18*(1), 37-54. https://doi.org/10.1007/s11409-022-09314-x

Varunki, M., Katajavuori, N., & Postareff, L. (2017). First-year students' approaches to learning, and factors related to change or stability in their deep approach during a pharmacy course. *Studies in Higher Education, 42*(2), 331-353. https://doi.org/10.1080/03075079.2015.1049140

Vlachopanou, P., & Karagiannopoulou, E. (2022). Defense styles, academic procrastination, psychological wellbeing, and approaches to learning: A person-oriented approach. *The Journal of Nervous and Mental Disease, 210*(3), 186-193. https://doi.org/10.1097/NMD.0000000000001423

Wijaya, A. P., Nusantara, T., & Hidayanto, E. (2022). Students' analytical questions and interaction patterns in group discussion facilitated with a scientific approach learning. *Mathematics Teaching Research Journal, 14*(2), 61-71.

Yin, Y., Parpala, A., & Toom, A. (2023). The relationship between international higher education students' writing conceptions and approaches to learning. *Journal of Writing Research, 14*(3), 421-446. https://doi.org/10.17239/jowr-2023.14.03.04

Zilundu, P.L.M., Chibhabha, F., Chengetanai, S., Fu, R., & Zhou, L-H. (2022). Zimbabwean preclinical medical students use of deep and strategic study approaches to learn anatomy at two new medical schools. *Anatomical Sciences Education, 15*, 198-209. https://doi.org/10.1002/ase.2064