

Supporting students' development of self-regulated learning using a diagnostic questionnaire tool

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Abstract

This paper provides an evaluative report on the use of a questionnaire as a diagnostic tool to support undergraduate students' development of self-regulated learning. The diagnostic tool to be used is the Motivated Strategies for Learning Questionnaire (MSLQ). A considerable body of research highlights the significance of self-regulated learning to support student success. This study investigates my application of the MSLQ as a diagnostic tool to support twenty-three undergraduate participants, undertaking a three-year undergraduate professional education degree for practitioners supporting clinical surgery. The students were studying in a higher education institution in the North West of England. The intervention consisted of a presentation to the participants followed by their completion of an eighty-one-point questionnaire. On completion, the emergent data allowed each participant to be informed by tutors of relevant improvement strategies and the support available to them. A focus group generated data that provides insight into the efficacy of the intervention from the perspective of the students.

Introduction

During their transition into higher education, many undergraduate students experience economic, psychological, social, or personal challenges (Toshalis and Nakkula, 2012). Apart from these challenges, there is an assumption that students have the necessary skills to organise their own learning and be effective in time management. Whilst many students do come with these skills it cannot be assumed that all students will have the required ability to succeed at HE, thus this gives me an ample opportunity to use the MSLQ. Moreover, motivation is a vital attribute that many students possess, and it can either internally or externally inspired students' goal to succeed (Williams and Williams 2011). Nevertheless, high levels of motivation by itself do not warrant a high level of success. Unfortunately, this motivation may decline due to some students not having the knowledge or skills to meet their goals and take ownership of their learning (Williams and Williams, 2011; Nakkula, 2013; Toshalis and Nakkula, 2012).

Within professional healthcare undergraduate education in England, including nursing and allied health professionals, it has been suggested that due to the previous government policy of '*widening participation*' at university that this contributed to the growing rates of students leaving their chosen courses (Glasper, 2008:924). Widening participation has increased with many students from lower income backgrounds attending university, in some cases for the first time in their family. The work of McKendry, Wright and Stevenson (2013) points out that these factors contribute to increasing attrition rates. Therefore, students who enter university from traditional school or college may not have the acquired necessary skills to equip them in preparation for university. Subsequently, the work undertaken in this study is not just related to healthcare, but it is a worldwide issue arguably with undergraduate students across many disciplines.

Within this context it is intriguing to evaluate strategies designed to develop students as self-regulated learners. A range of methods have been employed to address this issue of supporting students who are unprepared for higher education (Abele, Penprase and Ternes 2011; Bass et al., 2015; Cholewa et

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al. 2017; Hughes, 2013). The principal aim for this study is to evaluate an intervention with first year students studying for an undergraduate health profession degree 'Operating Department Practitioner'. The rationale was to determine which necessary skills, attributes and strategies the students needed to gain and develop further to become more proficient as self-regulated learners. Therefore, the MSLQ was used as a diagnostic tool to promote self-regulating learning methods to benefit the individual students. A considerable range of advice and assistance was already available within the university and so, based on the diagnostic tool, students could be signposted by tutors to where they could access relevant support.

Literature review

Skinner et al. (2014) describes Self-Regulated Learning (SRL) as a life skill that once mastered can be utilised in many situations as well as classroom settings. Undergraduate professional education students would clearly benefit from SRL; employing it within academia, as well as practice (clinical settings). Development of SRL is likely to have a positive impact on individual student attainment (Lucieer et al, (2016).

In his much earlier study, Knowles (1975) described SRL as self-directed learning as students' optimism to their own learning by identifying their learning needs such as: setting goals, selecting appropriate learning methods and their associated application. More than thirty years later, Zimmerman (2008) articulated that SRL could be viewed as a 'proactive process' which develops a learner from being passive to being active with support and guidance from tutors and assistance within the learning environment including self-reflection. However, the overarching consensus within the literature is that SRL draws on metacognitive; cognitive; proactive: behavioural and motivational components of learning (Knowles, 1975; Zimmerman, 2008).

To investigate the credibility of SRL, Murad et al. (2010:1) conducted a meta-analysis of 'fifty-nine' studies where SRL was deployed. In their conclusion, they advocated that SRL had been more effective than traditional methods of learning. This is supported by the more recent work of Lucieer et al. (2016) who concluded that they observed a positive development from the students' results. Nevertheless, a sense of understanding SRL is paramount for the tutor prospective, before implementation of SRL to ensure any success from the students (Embo and Valcke, 2014; Rezaee and Nabeiel, 2015; Skinner et al., 2015). Albeit, there are various self-analysis instruments to assist students to identify which strategies to embrace whilst learning how to do SRL.

Within the literature there appears to be numerous applications of tools that can be used to measure SRL (Roth, Ogin and Schmitz, 2015). Roth, Ogin and Schmitz (2015) conducted a systematic literature review of current tools in use within HE institutes. They highlighted several tools which may be used within HE, however each tool has its own strengths and weakness. Tay (2015) highlights that using interviews is an example of one such tool. However, Bowling (2005) concluded that the presence of the interviewer may influence the student and the responses they provide. With regards to this study, this approach was considered but it was determined time consuming and possibly not cost effective as resources would be needed to record and transcribe interviews to provide data for analysis (Bowling, 2005).

Dorrenbacher & Perels (2016) and Nandagopal & Ericsson (2011) employ learning diaries to measure SRL. Although using diaries can measure assessment, they can also measure monitoring of learning. However, Roth, Ogin and Schmitz (2015) indicate there is a reduced validity of using deeper learning strategies and their deployment. Being mindful of the use of diaries, especially their credibility and validity, it was felt that there was a need to emphasise various strategies to the students to embrace SRL so these were not considered as a viable approach within the context of this study. Using think out aloud techniques is another tool (Ward and Traweek, (1993). In this instance the tutor would

communicate what task is to be considered and the student would verbalise their thoughts as if performing the task, for example narrating a task or action. However, as Branch (2000) suggests a larger cognitive processing is required from the student and some may present issues with performing such a task. Again, within the context of this study it was felt that this was likely to be time consuming and as questionable regarding the credibility and validity in its application to this research.

Finally, another tool to measure SRL is the use of questionnaires. Several questionnaires appear within the studies presented namely the MSLQ (Pintrich et al., 1991) and the Learning and Study Strategies Inventory (LASSI) (Weinstein, Palmer and Acee, 2016). Although extensively used within HE, questionnaires are often dismissed due to not highlighting what learning strategies are to be embedded (Roth, Ogin and Schmitz, 2015). However, Roth, Ogin and Scmitz (2015) do conclude from their review of self-reporting instruments that MSLQ emerges as the most commonly used SRL tool employed, albeit with varied degrees of success.

Henceforth, given the situation of the lead researcher of this study as someone who is employed at a large HE, resources are already plentiful for students to access learning strategies and support. Thus, this led to the use of MSLQ, as the primary research tool to be employed within this study. Original information from the initial implementation MSLQ was readily accessible and the authors and originators of it were approached to see if they would agree to it being used within this study, this approval was freely granted.

Methods and Ethical Considerations

Ultimately, when considered holistically, these have led the author of this study to examine the MSLQ and its credibility and validity with a cohort of undergraduate students within their first year of studying a BSc (Hons) ODP course to determine if is still applicable. The selected group consisted of twenty-three undergraduate ODP students within their first year of study of a three-year BSc programme. It was decided to implement the MSLQ after the participants had completed their first assignment, so this could also be used as an initial means of self-reflection to further aid participants in positioning themselves regarding recognising their own need for further study support. The cohort of participants consisted of twenty females and three males. The median age for participants across the cohort was twenty-four with the range being from eighteen to forty-nine. Ethical approval was granted as the study met all guiding principles including those in relation to the rigour of the work itself. To highlight, no financial incentives or payments were offered to the participants and it was made explicit that they would be participating as volunteers of this study. Additionally, all ethical guidelines prescribed by the British Education Research Association (BERA), (2011) were incorporated into this study.

Procedure.

An introduction to the study and MSLQ was given to the volunteers with a brief rationale and understanding of its use within HE to the participants, highlighted the benefits and inform them how to complete the MSLQ, on completion a focus group was facilitated followed by an evaluation of its credibility and use. A very brief introduction was presented to the whole cohort outlining the process of the study, outlining ethical requirements the overall rationale of the study and asking for participants. Once the participants had been confirmed, this was by a show of hands, they were asked to complete the MSLQ questionnaire online using the Bristol Online Survey (BOS) tool.

Ethical approval was granted as the study met all guiding principles including those in relation to the rigour of the work itself. To highlight, no financial incentives or payments were offered to the participants and it was made explicit that they would be participating as volunteers of this study. The actual MSLQ consists of eighty-one questions and the questions pertain to two sections to assess motivation and learning strategies. Overall there are fifteen subsections within these two sections.

Firstly, within motivation there are intrinsic goal orientations, extrinsic goal orientation, task value, and control beliefs, self-efficacy for learning and performance and test anxiety. For cognitive and metacognitive strategies, there are the following subsections: rehearsal, elaboration, organisation, critical thinking, metacognitive self-regulation, time and study environment, effort regulation, peer learning and help seeking. The participants completed the MSLQ by using a Likert (Bertram, 2008) scale by answering from 1 (not at all true of me) to 7 (very true of me) for example, question one asks, 'In a class like this, I prefer course material that really challenges me, so I can learn new things?' (Pintrich et al., 1991:14).

On completion of the MSLQ, the responses were then exported to a Microsoft Excel work book and the data then formed the feedback to participants. This feedback was emailed to each participant with an explanation of their result interpretation. The results suggested that if they had a score above four it was deemed as acceptable. The only exception to this was the anxiety question results, where a higher score revealed greater anxiety of exams. Within this feedback as well as suggestions for the participants of how they could change their current study habits they were also signposted to where additional support within the university could be accessed.

Additionally, the scores highlighted the average score for the class with the bottom 25%, middle 50% and top 25% and a mean for the cohort as a group. Consequently, each participant could see if they were in the top 25% of respondents and if strategies they were employing were working, or, if they were in the bottom 25% then they would have opportunity to change their current study habits and patterns with an anticipated positive correlation to increase motivation. The participants were given their motivation, motivation and expectancy for success, test anxiety feedback and scores. Then feedback was provided regarding cognitive scales namely cognitive strategy rehearsal, elaboration, organisation; metacognition, resource management and study space, and resource management self-effort. The complete questionnaire and feedback were given as stipulated in the manual of the MSLQ (Pintrich et al. 1991) to remain true to the guiding principles of the original work.

Main Findings

Upon receiving their feedback, a focus group was organised for the participants to feedback about their experience of using the MSLQ as a tool. The focus group took place in a location within the university and lasted for approximately an hour: and it was digitally recorded. The recording of the focus group was then transcribed verbatim, analysed by means of implementing thematic analysis (Aveyard, 2014; Braun and Clarke, 2006; Morse and Field, 1996;). In analysing the data, repeated and regular patterns were identified, then coded into categories. Participants' comments about their engagement with the MSLQ were grouped into three identified themes and these are presented and discussed in the next session of this paper.

Theme 'Some people were not prepared for HE'

What seemed very apparent from the focus group and the responses given was that some of the participants felt they were not prepared for HE as there was a agreement in the focus group. The participants reported that they felt the actual timing of the implementation of the MSLQ was valid as this created an awareness of what they felt they had to do to improve their studies. They also noted that, although support was plentiful within the university, the feedback from the MSLQ was effective in signposting them to resources which were useful to them on an individual level. One participant reported-

'I can say that coming to University straight from college, I did not know what the writing and studying would be, and this has helped me definitely' (Participant 3).

Whereas another reported-

'It will be perfect to tweak my learning style and able me to achieve move during my studies, because I do not think I was ready for University' (Participant 4).

Another participant noted that-

'On the whole my scores have been an eye opener, because I never knew what I needed to improve or get better' (Participant 6).

However, another participant reported

'I think it does not matter what you did at college, coming and doing the work in University is completely different' (Participant 8).

Yet another reported-

'Yeah, I felt that after I did my first assignment, then doing the MSLQ, I know where I need to improve to get better results' (Participant 15).

Theme 'I felt the MSLQ was really good in showing where I need help'

All the participants felt that the MSLQ was beneficial in signposting where they were weak. Although five reported the actual length and time needed to complete the MSLQ as being lengthy. However, all the participants, once they had their feedback given to them, understood why it was so comprehensive upon receiving their individualised in-depth feedback. Firstly, one participant reported-

'Found it interesting and how different things affect can you differently' (Participant 2).

Whereas another reported-

'The process itself was very easy with a simple questionnaire that covered all areas. The results are explained and easy to interpret' (Participant 5).

However, another participant reported-

'The initial questionnaire was a little long, but now I have received the results, I understand why as they are quite detailed' (Participant 8).

In contrast another participant reported that it was -

'Very easy to complete as did not ask too complicated questions and great feedback' (Participant 10).

In contrast another participant reported that

'Quite interesting as there were some unexpected really plus it was good to compare answers from across the study group to see the below mean and top percentiles' (Participant 20).

Theme 'I will focus on my areas of learning where I'm not very confident and use the suggestions from my feedback'

All the participants reported using the MSLQ as being a beneficial experience for them by highlighting where they needed support. It was noted that the use of the MSLQ signposted participants to specific interventions by highlighting where they may be weak, therefore offering support which was already available within the university. Participants did comment that they knew that there was support within the university, but they highlighted that they felt they would only use it as a last resort preferring to try and self-help where possible. A final emergent strand to this area is one where participants identified that they were reluctant to seek additional help as this made them 'feel stupid' However one candidate reported:

'Yes. I feel I was able to self-identify my areas of weakness, but the advice given to improve the score, I found very helpful' (Participant 8).

Whereas another reported-

'I will use it to identify my strengths and weaknesses and make a plan for how to improve upon these. It would be good if this were available per year to see personally what I have improved on and what I can still do better as the degree goes on' (Participant 14).

Another reported that

It has illustrated my lack of confidence in asking for help once the work gets difficult. I don't want to appear stupid and the feedback has illustrated it is OK to ask for help' (Participant 18).

In contrast another felt

'I might focus on my areas of learning where I am not very confident and use the suggestions from my feedback' (Participant 20).

Lastly one participant felt-

'I will use the feedback to make innovative approaches to the way i look at and tackle studies' (Participant 21).

Discussion and Analysis

Findings from this relatively small-scale study, indicate that several students coming into HE are not prepared for the academic transition from college or school to university. From the themes that have been identified there was an agreement from the volunteers in the focus groups on the themes highlighted. Not surprisingly in itself, the study also identifies themes which are of areas of concern. Theme one highlights that students did not know what was expected of them academically when they came to university. Within this theme indicators emerged to highlight that numerous students were not aware of how they actually learn and the processes by which they could be supported to understand and improve them. This theme aligns with the findings of Kukkonen, Suhonen and Salminen (2015); Robshaw and Smith (2004) and Tuckman and Kennedy (2011) who all suggest that students are not prepared for HE. Further studies by (Baker, 2017; McKendry, Wright and Stevenson, 2013) indicate that these results could have an increase in students leaving their studies and in turn having a detrimental impact on future workforce.

With the introduction of tuition fees, compounded with the psychological stress of change due to possible relocation, psychological or social challenges, economic concern can also add to their lack of preparation. However, what is clear is that universities must consider methods of reducing such tensions and deploy measures to try to alleviate this and thus support all students during their transition into HE. Findings from this study indicate a large-scale implementation of the MSLQ, could be a way to signpost students to what they need to improve and where they can go to seek such help.

Participants reported they felt by using the MSLQ, it successfully signposted where they were weak in their motivation or use of learning strategies, and this was encompassed in one theme. Some participants did report that the MSLQ was overly long, conversely, others reported that when they received their feedback they were highly impressed by the detailed report and signposting to support available within the university and they attributed this to the detail captured within the MSLQ. All participants reported that they liked the ease of engagement with the MSLQ questions and the physical way of completing it using the BOS tool. Additionally, from the onset, the application and use of the MSLQ within this small study emphasis was placed on ensuring that students were signposted to where support was available to them. This aligns with the principles highlighted by Roth, Ogin and Schmitz (2015) who conclude their work by highlighting that the implementation of learning strategies must be introduced to participants at the end of the process to provide credibility and support to students.

The final emergent theme highlighted that using the MSLQ demonstrated to the participants what their own weaknesses were. Upon self-reflection, some participants agreed that this was correct and something which they would have not identified it not using the MSLQ. What was encouraging was that several participants agreed, that once they had these weaknesses highlighted, they would apply different learning strategies suggested in the feedback from the report the MSLQ generated to improve them. Thus, demonstrating the positive impact of the MSLQ on an individual level. This theme

corroborated findings from previous studies including Nakkula, (2013); Toshalis and Nakkula (2012); Williams and Williams, (2011). In conjunction with this was the assertion by many of the participants that they were newly motivated with a varying degree of hopeful success, however, as identified in previous studies (Nakkula, (2013); Toshalis and Nakkula (2012); Williams and Williams, (2011); this motivation can dispense due to students not having the knowledge or skills to meet their studying goals. This is further supported by Kukkonen, Suhonen and Salminen, (2015); Robshaw and Smith, (2004), Tuckman and Kennedy (2011), who all agreed that one of the reasons for high attrition rates for undergraduate students was the apparent lack of preparation for HE.

Conclusion

From this study, it is apparent that one of the immediate limitations with using MSLQ is that the user must be honest in their answers as this will have an undefined impact on their bespoke recommendations. Undefined as one answer, may skew a group response in the final report and once amalgamated, it would be hard to determine which answer was having the specific impact. Additionally, it is noted that, the length of the MSLQ and the time it takes to complete the MSLQ may lead students to feel it is too long to engage with, and maybe view its completion as unnecessary

The initial aim of this small study was to provide a rationale for the application of the MSLQ and determine its usefulness with a group of ODP students with a view to use this as a diagnostic tool to promote self-regulating learning. This was achieved by applying the MSLQ to a group of twenty-three volunteer participants. Having completed the MSLQ and in receipt of their feedback, participants agreed that the feedback was in-depth and very useful at signposting them to areas for further support within the university. Additionally, to this the questionnaire will not actually provide any evidence in the form of data, to highlight that students use self-regulating learning. Therefore, another method to collect data could be in the form of logs of self-reports (Jeske, Backhaus and Stamo, 2013), consequently a method to measure behaviour and improvement of self-regulating learning could be feasible.

Given these conclusions, the next stage would be to implement the MSLQ to a wider cohort and possible across all HE programs to see if it should be included in all induction and transition processes. Additionally, to this, would be the possibility of constructing an online version, to make student engagement more viable. Evaluation of its effectiveness could be achieved through two supporting mechanisms- student feedback (like that obtained to validate this small-scale study), and an engagement report from the services highlighted to see if (a) they have increased student engagement and (b) the source of signposting students to the services was indeed the MSLQ. A possible suggestion could be to revisit this group of volunteers and look at the effects this has had on them and what possible strategies they may have implemented to aid self-regulating learning.

References

- Abele, C., Penprase, B., Ternes, R. (2013) 'A closer look at academic probation and attrition: What courses are predictive of nursing student success?', *Nurse Education Today*, 33, pp. 258-261.
- Aveyard, H. (2014) *Doing a Literature Review in Health and Social Care a practical guide* Third edition. Maidenhead. McGraw-Hill Education.
- Baker, S. (2017) *Dropout rate for young UK students rises again*. Available at: www.timeshighereducation.com (Accessed: January 2018).
- Bass, J., Walters, C., Toohill, J., Sidebotham, M. (2015) 'Promoting Retention, enabling success: Discovering the potential of student support circles', *Nurse Education in Practice*, 20, pp.109-116.
- Bertram, D. (2008) Likert Scales. Available at: www.my.ilstu.edu/~eostewa/497/Likert%20topic-dane-likert.pdf. (Accessed: April 2018).

- Bowling, A. (2005) 'Mode of questionnaire administration can have serious effects on data quality', *Journal of Public Health*, 27(3), pp.281-291.
- Branch, J. L. (2000) 'Investigating the information-seeking process of adolescents: the value of using think aloud and thinks afters', *Library and Information Science Research*, 22(4), pp.371-392.
- Braun, V. Clarke, V. (2006) 'Using Thematic Analysis in Psychology', *Qualitative research in Psychology*, 3, pp. 77-101.
- British Education Research Association (2011) *Ethical Guidelines for Educational Research*. London: British Educational Research Association.
- Cholewa, B., Schulthes, G., Hull, M., F., Bailey, B., J., Brown, J. (2017) 'Building on what works: Supporting Underprepared Students through a low-cost counselling intervention', *Journal of Student Affairs research and practice*, 54(3), pp.261-274.
- Dorrenbacher, L., Perels, F. (2016) 'More is more? Evaluation of interventions to foster self-regulated learning in college', *International journal of educational research*, 78, pp.50-65.
- Embo, M., Valcke, M. (2014) 'Workplace learning in Midwifery education in Flanders (Belgium)', *Midwifery*, 33, pp.24-27.
- Glasper, A. (2008) 'Widening participation in pre-registration nursing', *British Journal of Nursing*, 19(14), pp.924-925.
- Hughes, H., A. (2013) 'Factors influencing attrition rates in midwifery students', *Nursing Standard*, 27(26), pp.42-48.
- Knowles, M., S. (1975) *Self-directed learning: a guide for learners and Teachers*. New York (NY): Association Press.
- Kukkonen, P., Suhonen, R., Salminen, L. (2015) 'Discontinued students in nursing education- Who and Why?' *Nurse Education in Practice*, 17, pp.67-73.
- Lucieer, S., M., Jonker, L., Visscher, C., Rikers, R., M., Themmen, A., P. (2016) 'Self-regulated learning and academic performance in medical education', *Medical Teaching*, 38, (6), pp.585-593.
- McKendry S., Wright, M., Stevenson, K. (2013) 'Why here and why stay? Students' voices on the retention strategies of a widening participation university', *Nurse Education Today*, 34, pp.872-877.
- Morse, J, M, Field, P, A. (1996) *Nursing Research: The Application of Qualitative Approaches*. London: Chapman and Hall.
- Murad, M., H., Coto-Yglesias, F., Varkey, P., Prokop, L., J., Murad, A., L. (2010) 'The effectiveness of self-directed learning in health professions education: a systematic review', *Medical Education*, 44(11), pp.1057-1068.
- Nakkula, M. (2013) 'A crooked path to success', *The Phi Delta Kappan*, 94(6), pp.60-63.
- Nandagopal, K., Ericsson, K, A. (2011) 'An expert performance approach to the study of individual differences in self-regulated learning activities in upper-level college students', *Learning and Individual Differences*, 22, pp. 597-609.
- Pintrich, P., R., Smith, D., A., T., Garcia, T., McKeachie, W., J. (1991) *A Manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Available at: <https://files.eric.ed.gov> (Accessed: 10 September 2017).
- Rezaee, R., Nabeiei, P. (2015) 'Effect of Workshop Training on Self-Directed Learning Skills of Students at Shiraz University of Medical Sciences', *Research and Development in Medical Education*, 4(2), pp. 129-131.
- Robshaw., M., Smith, J. (2004) 'Keeping afloat! Student nurses' experiences following assignment referral', *Nurse Education Today*, 24, pp.511-520.
- Roth, A., Orgin, S., Schmitz, B. (2014) 'Assessing self-regulated learning in higher education: a systematic literature review of self-report instruments', *Educational Assessment, Evaluation and Accountability*, 28(3), pp. 225-250.
- Skinner, D., Saylor, C., Boone, E., Rye, K., Berry, K., Kennedy, R. (2014) 'Becoming a lifelong learner: A study in Self-Regulated Learning', *The Journal of Allied Health*, 44(3), pp. 172-188.

- Tay, H., Y. (2015) 'Setting formative assessments in real-world contexts to facilitate self-regulated learning', *Education Research policy Practice*, 14, pp. 169-187.
- Toshalis, E., Nakkula, M., J. (2012) 'Motivation, Engagement and Student Voice', *The Education Digest*, 78(1), pp. 29-35.
- Ward, L., Traweek, D. (1993) 'Application of a metacognitive strategy to assessment, intervention, and consolation: A think out-aloud technique', *Journal of School Psychology*, 31, pp. 469-485.
- Weinstein, C., E., Palmer, D., R., Accee, T., W. (2016) Learning and Study Strategies Inventory, 3rd Edition Learning and Study Strategies Inventory. Available at: <http://www.hhpublishing.com> (Accessed: 12 January 2018).
- Williams, K., Williams, C. (2011) 'Five key ingredients for improving student motivation', *Research in Higher Education Journal*, 10(2), pp. 1-25.
- Zimmerman, B. (2008) 'Investigating self-Regulation and Motivation: Historical Background, Methodological Developments and Future Prospects', *American Educational Research Journal*, 45(1), pp. 166-183.