Professionalization on the Go: A Latent Profile Analysis in Self-Regulated Learning of Flemish Teachers in a Mobile Learning Environment

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Abstract
Teachers have long been using mobile devices to support their personal learning. Especially during the COVID-pandemic, the professionalization of teachers demanded the use of mobile solutions, which requires them to apply self-regulated learning strategies. This article focuses on mobile self-regulated professional learning of Flemish teachers in primary education. The study examined (1) which profiles in self-regulated learning can be distinguished in a mobile learning environment and (2) whether there is a correlation between mobile self-regulated learning and the willingness to call on mobile learning. An explorative study was conducted by interviewing primary teachers (N=141) by means of an online survey. An explorative factor analysis confirmed that there are ten latent factors, which clustered around eight components (1) self-efficacy, (2) help seeking, (3) task appreciation, (4) goal-setting, (5) self-reflection, (6) strategical planning, (7) concretization and (8) metacognitive strategies. When comparing the subscales to age, a significant positive correlation was found with metacognitive strategies and strategical planning, indicating that older teachers utilized these self-regulatory strategies more than younger participants. In sequence, a latent cluster analysis identified two profiles in mobile self-regulated learning, namely a moderate and high profile in self-regulated learning. Furthermore, a bivariate test with Pearson correlation coefficient confirmed that there is a positive correlation between the overall score of mobile self-regulated learning of teachers and the degree to which they are willing to use mobile learning for their professional learning. More specifically, a correlation was found with the self-regulated learning skills: metacognitive learning strategies, self-reflection, concretization, and goal-setting.

Keywords: Teacher Self-Regulated Learning, Mobile Professional Learning, Professionalization

Introduction

One of the most important influencing factors for quality teaching is the presence of an effective teacher (Timperley & Alton-Lee, 2008). Professionalization can be defined as the learning process of teachers to improve classroom practice (Avalos, 2011). Teachers are expected to innovate and learn independently (Butler et al., 2004; Peeters et al., 2014; Timperley & Alton-Lee, 2008), which requires them to apply self-regulated learning strategies and skills. Moreover, the presence of teachers' self-regulatory skills has been found to positively influence students' self-regulated learning (Peeters et al., 2014), which in turn supports students' motivation and self-confidence (Vandevelde et al., 2013), increases later participation in lifelong learning (Bandura, 2006) and positively influences their learning outcomes at school (Peeters et al., 2014).

In recent decades, mobile learning environments have made their appearance in various educational settings and sectors, including compulsory education as well as teacher professionalization programmes (Aubusson et al., 2009). Mobile learning tools are accessible to users anytime, anywhere, leading to the increased flexibility of learning (Aarreniemi-Jokipelto & Goulart, 2018). Moreover, mobile learning is associated with greater learner autonomy (Jansen et al., 2017) and can therefore meet teachers' learning and professionalization needs (Elliott, 2017). On the other hand, the learners' autonomy in mobile learning requires the application of self-regulated learning strategies (Vanslambrouck et al., 2019).

Although the core concepts of mobile learning, self-regulated learning and teacher professionalization are interrelated and have several common threads, limited research has been conducted that brings all three concepts together. Within the context of mobile teacher professionalization (see, e.g., Elliott, 2017; Vu et al., 2014) research focuses mostly on promoting the self-regulated learning of students through teachers' professional development, but not on the self-regulated learning of the teachers themselves. In turn, research focusing specifically on teachers' self-regulated learning does not put focus on mobile or online learning environments (Delfino et al., 2010; Peeters et al., 2014). This research explores the relationship between teachers' self-regulated learning on the one hand and the use of mobile learning tools on the other. Thus, it contributes to the further theoretical underpinning of the concept of teachers' mobile self-regulated learning and, within a context of mobile professionalization, allows for adequate support for teachers in this regard (Kim et al., 2019).

Teacher self-regulated learning

Self-regulated learning (SRL) is defined as a complex and voluntary process, in which the learner proactively directs their learning process towards the achievement of a certain goal (Dunn & Rakes, 2015). Within this cyclical learning process, Zimmerman (2002) distinguishes three phases. The *forethought phase* precedes task performance and involves activities related to learner motivation and planning of the task. It then moves on to the *performance phase*, in which the individual self-observes and controls their behaviour to actively improve their learning. Finally, the *self-reflection phase* involves looking back on the learning situation and evaluating the learning progress or outcomes. In general, self-regulated learning starts from autonomous behavioural and emotional regulation (Zimmerman, 2002) and encompasses several domains, namely: metacognition, behaviours, motivation and context (Vanslambrouck et al., 2019).

In terms of teachers' self-regulated learning, Peeters et al. (2014) distinguish (1) the self-regulation of teaching as a response to what occurs in practice and (2) the self-regulation of the teacher's own learning. Teachers who are proficient in self-regulated learning are better able to define meaningful learning experiences and adjust their teaching according to what they have learned (Peeters et al., 2014). Furthermore, they show higher levels of motivation and self-efficacy to engage in learning (Ghonsooly & Ghanizadeh, 2013). Butler (2003) argues that the core purpose of professionalization is to restructure teachers' knowledge by exposing links between theory and practice. Applying self-regulated learning strategies, like reflection-in-action, allows teachers to connect prior learning to practice leading to more meaningful learning (Tillema & Kremer-Hayon, 2002).

Mobile and self-regulated professional learning

Mobile learning supports reflection-in-action (Aubusson et al., 2009) because mobile resources are quickly accessible and allow the user to capture practical experiences efficiently. Aarreniemi-Jokipelto and Goulart (2018) define mobile learning as learning using mobile devices such as laptops, tablets and smartphones (Aarreniemi-Jokipelto & Goulart, 2018; Burden et al., 2019), but it also points to learner mobility (Aarreniemi-Jokipelto & Goulart, 2018; Aubusson et al., 2009, p.234). The use of portable devices offers a way to learn anytime and anywhere (Motiwalla, 2007) and can support and reinforce authentic learning situations (Zydney & Warner, 2016). For example, users can search for information related to something they have just encountered (Hsu & Ching, 2015). Furthermore, the implementation of mobile learning supports teachers' self-regulated learning by offering the possibility for immediate feedback (Hsu, 2015), the personalisation of learning experiences (Wei & Chou, 2020) and it allows concrete experiences to be shared with others, for example by using video recordings and to build on them later (King et al., 2018).

To ensure qualitative online learning, self-regulated learning is considered a prerequisite (Bothma & Monteith, 2004; Inan et al., 2017). Due to the high autonomy of the learner within an online learning context, as it is often less structured than a formal learning environment, the learner needs to apply self-regulated learning strategies (Tseng et al., 2018; Kim et al., 2019; Vanslambrouck et al., 2019). Furthermore, motivational self-regulatory strategies are positively associated with learner engagement (Artino & Stephens, 2009). Being able to self-motivate prevents disengagement in the learning process, leading to higher success rates in online learning environments. Additionally, a positive self-perception of technology use and autonomous learning influence the willingness to learn online, which in turn is an important predictor of achieving intended learning outcomes in online learning (Wei & Chou, 2020).

Measuring teachers' mobile self-regulated learning

As self-regulated learning is proven to be important in mobile learning, different scholars have measured learners' abilities to self-regulate their mobile learning. Vanslambrouck et al. (2019) argue that self-regulated learning can be expressed in both qualitative and quantitative ways. The quantitative interpretation of self-regulated learning assumes that the more learning strategies are used, the higher the self-regulated learning profile. The qualitative interpretation considers the efficiency of strategies as a function of learning outcomes (Vanslambrouck et al., 2019).

Using the Online Self-regulated learning questionnaire (OSLQ) by Barnard et al. (2009), Vanslambrouck et al. (2019) found a distinction between a high, medium and low self-regulated learning profile among adult students in a blended learning environment. According to their findings, students in the high profile score better on time management, whilst students in the low profile need more support from peers or an instructor. In contrast, a study conducted by Barnard-Brak et al. (2010) found five profiles using the same instrument as Vanslambrouck et al. (2019) on a sample of university students. Here, individuals in a first profile scored low on all subscales while the second profile shows individuals who scored high across the board. In addition, Barnard-Brak et al. (2010) found a class that scores relatively high, but not to the same extent as the latter group. The other two profiles score strongly on certain subscales. Whilst one class scores higher on skills linked to the preparatory phase of self-regulated learning (cf. goal-setting and environmental structuring), the latter class scores higher on skills linked to the implementation and reflection phase, namely: help-seeking, self-assessment and task strategies. Though these studies provide useful insights in the mobile self-regulated learning of adult students, neither focuses on non-academic contexts, professionalization or teachers in specific. As mobile self-regulated learning can differ according to context and personal characteristics (Greene & Azevedo, 2007), it is important to study the concept with different target groups.

Aim of the study

This study aimed to examine the self-regulated learning skills of primary teachers using mobile devices to support their professional development. The following research questions were addressed:

1. Which self-regulated learning profiles can be distinguished with Flemish primary teachers that use mobile learning resources to support their professionalization?

2. How does the willingness to use mobile learning resources correlate with the self-regulated learning of Flemish primary teachers in light of their professionalization?
    a. What is the correlation with their self-regulated learning?
    b. What is the correlation with the components of self-regulated learning?
    c. What is the correlation with the observed profiles?

Method

Context, participants, and procedure

Data for this quantitative study were collected from December 2020 until February 2021 using online surveys. A random multistage sample was used for this purpose (Lynn, 2011). In the initial stage, seventeen of the 300 Flemish municipalities were drawn, after which three schools were drawn from each municipality. Using the address lists on the website of the Flemish Ministry of Education and Training (2020), the principals of these schools were contacted to ask them to pass on the survey to the teachers. Because of the low response rate, the respondents were further supplemented with a convenience sample (Alkassim et al., 2016), in which the principal researcher reached out to schools and teachers in her immediate vicinity to complete the survey and pass it on to others. In addition, the survey was shared in Facebook groups of primary school teachers at three different times.

In total, 141 Flemish primary teachers were included in the study of which 119 were ordinary primary school teachers and 22 special education teachers. 16 of them were male and 125 were female. This male-female ratio was representative of the population (±12%; Department of Education and Training, 2020). The mean age of the respondents was 34 years (*SD* = 11.02) with a range of 21 to 60 years.

Instruments

The survey was constructed in three parts: (1) demographic characteristics, (2) willingness to engage with mobile learning and (3) teachers' self-regulated learning. To operationalize the core concept of mobile learning two questions were developed: (1) how often have you already used these resources and (2) what resources would you ever turn to on your initiative? The instruction here referred to the use of mobile resources as a function of their own professionalization and explicitly not for the benefit of the students. Respondents were presented with a list of mobile resources, where they could answer the question for each resource on a scale ranging from (1) never to (5) daily. To determine the list of mobile resources, an inventory was created by entering the search term 'TI = ("mobile" OR "online") AND ("professional development" OR "teacher education")' into the Web of Science platform. The results were narrowed by category (= educational research) and by publication date (= 2016 to 2020). The search term yielded a total of 141 articles. The titles, keywords and abstracts were then scanned for any reference to mobile learning resources. This enumeration was further supplemented with resources already found in the earlier literature search. The list was then simplified by taking synonyms and highly related resources together. This yielded an inventory of thirteen items: social media, online professional learning communities, online courses, apps, videos, online workshops, online learning materials, online mentoring, e-books, blogs or blogging, e-portfolio, podcasts and educational games.

To survey self-regulated learning the SRLMQ (Littlejohn et al., 2016), a 5-point Likert scale, was adapted and translated to fit the scope of the research. The participants answered 42 questions with a value ranging from (1) not at all true for me to (5) very true for me. To administer this survey to Flemish teachers, the questionnaire was translated into Dutch. Linguistic equivalence (Peña, 2007, p. 1256) was pursued through a simplified version of the back-translation method of Beaton and Guillemin (2000) where two linguists worked together to translate the questionnaire. In the first stage, one of the linguists translated the original English questionnaire into Dutch, after which the translated questionnaire was back-translated by the second linguist. The second linguist who performed the back-translation was not familiar with the original version or with the core concepts of the study. In the final stage, the three versions of the questionnaire (original questionnaire, translation and back-translation) were compared with each other, with discrepancies eliminated in concert. This qualitative validity check led to the approval of the Dutch questionnaire.

As a second qualitative validity check, the online survey was tested by three teachers and modified according to their feedback. The full questionnaire was further discussed and refined in collaboration with the co-authors.

Data analysis

First, the data were fed into SPSS 26 and checked for errors and missing values. An exploratory factor analysis (EFA; Henson & Roberts, 2006; Yong & Pearce, 2013) with a

Varimax rotation was conducted (Yong & Pearce, 2013) to check the 42 translated items regarding self-regulated learning for validity. The components found were then combined into an overall score.

To find out if latent profiles could be identified, a cluster analysis was performed. Because the number of profiles was not known in advance, two hierarchical agglomerative cluster analyses were performed. A k-means cluster analysis was conducted to assign the cases to the appropriate cluster (Landau & Everitt, 2004). To control for heterogeneity, different models were compared using the Akaike information criterion (AIC) and the Bayesian information criterion (BIC), with a smaller value indicating a better fit (Vanslambrouck et al., 2019; Witherspoon et al., 2019). Based on the observation of different profiles, a new variable was created that classifies respondents according to the profile they belong to.

To study teachers' willingness to engage in mobile learning, a second exploratory factor analysis was conducted on the thirteen questionnaire items. The different components were checked for homogeneity (Cronbach's alpha > .60) and then pooled into a score (Gliem & Gliem, 2003). Lastly, a t-test was conducted (Field, 2017) to examine whether the willingness to use mobile resources (test variable) in the context of professionalization was correlated with: (1) the teachers' self-regulated learning profile, (2) their overall self-regulated learning score, and (3) the subcomponents of self-regulated learning (split variables).

Results

Self-regulated learning of primary teachers

To assess teachers' self-regulated learning, an exploratory factor analysis with a Varimax rotation KMO = .84 proved that the sample size was adequate and desirable for factor analysis (Beavers et al., 2019). Bartlett's test of sphericity $X^2(861) = 3094.24$, $p < .001$ showed that the correlations between the items were large enough to perform the EFA (Field, 2017). The results of the factor analysis did not match the original questionnaire. According to the analysis, there are ten latent factors with eigenvalues > 1 (Costello & Osborne, 2005). Together, these explain 65.99% of the variance. Items clustered around the same component showed that eight components were involved (factor loading > .50). Four of those components matched the original questionnaire and were therefore labelled the same: (1) self-efficacy, (2) help-seeking, (3) task appreciation, and (4) goal-setting. A fifth scale contained all items from the self-reflection phase except for one item and was therefore labelled as (5) self-reflection. In labelling the remaining three scales, the similarity of the items was considered which resulted in the following labels: (6) strategic planning; (7) concretization, indicating with learning gains translated into more concrete insights for practice and; (8) metacognitive learning strategies (Pintrich et al., 1991). For each scale, the items were checked for homogeneity using Cronbach's alpha > .60 (Gliem & Gliem, 2003). Table 1 summarizes the means and standard deviations of the variables used. It shows that respondents scored highest on the metacognitive learning strategies subscale ($M = 3.90$; $SD = 0.85$), followed by self-efficacy ($M = 3.69$; $SD = 0.65$) and goal-setting ($M = 3.69$; $SD = 0.77$). However, task appreciation was scored lowest ($M = 3.09$; $SD = 0.69$). Standard deviations were generally small, but the values of help-seeking had the greatest variance and those of concretization the smallest.

	M	*SD*	Cronbach's alfa	range
Self-Regulated Learning	27.98	3.97	.825	8 - 40
Subscales SRL				
Metacognitive strategies	3.90	0.85	.780	1 - 5
Self-Efficacy	3.69	0.65	.788	1 – 5
Setting goals	3.69	0.77	.712	1 – 5
Concretization	3.50	0.69	.801	1 – 5
Help-seeking	3.43	0.66	.894	1 – 5
Strategical planning	3.35	0.82	.730	1 – 5
Self-Reflection	3.29	0.73	.812	1 – 5
Task interest	3.09	0.69	.801	1 – 5

Table 1. Descriptive statistics of used variables and scales of teachers' self-regulated learning *(*N=*141)*

When the subscales of teachers' self-regulated learning were related to age, a moderately significant positive relationship was found with metacognitive learning strategies ($r = .210$; $p < .05$; $N = 141$) and strategic planning ($r = .229$; $p < .01$; $N = 141$). Indicating that the older the respondent, the higher also the use of strategic planning and metacognitive learning strategies.

Profiles in mobile self-regulated learning

To identify the number of subpopulations two agglomerative hierarchical cluster analyses were conducted on the eight scales found in mobile self-regulated learning. It was opted to use the Euclidean distance because interval scales were used (Madhulatha, 2012). Next, the farthest neighbour method (Landau & Everitt, 2004) was used for the first hierarchical analysis. Both the elbow method (Alhussain, 2018) and the between-group linkage method proved a model with two clusters to be the best fit.

Secondly, a k-means cluster analysis was performed to assign the cases to one of the two clusters. Then, as a final control measure, this two-cluster model was compared with a three- to five-cluster model (Table 2). For the Akaike information criterion (AIC) and the Bayesian information criterion (BIC) a lower value indicated a better fit (AIC = 181.49 and BIC = 184.44) (Vanslambrouck et al., 2019; Witherspoon et al., 2019). Whilst for the Log Likelihood a higher value testifies to a better fit (LL = -179.49) (Vanslambrouck et al., 2019; Witherspoon et al., 2019).

	LL	AIC	BIC
2 profiles	-179.49	181.49	184.44
3 profiles	-280.31	284.31	290.21
4 profiles	-371.51	377.15	385.99
5 profiles	-406.17	414.17	425.97

Table 2. Comparative fit parameters for models with clusters varying from 2 to 5

The analysis showed that the two-class model was the most appropriate. It can be concluded from the independent sample t-test that the first profile scored significantly lower on each subscale than profile 2 (Table 3).

	Profile 1 (=average self-regulated learning) (*N*=47)	Profile 2 (= high self-regulated learning) (*N*=94)
	M(*SD*)	*M*(*SD*)
Help-seeking	3.41^{***} (0.86)	4.15^{***} (0.73)
Concretization	3.16^{***} (0.54)	3.95^{***} (0.53)
Task interest	3.00^{***} (0.65)	4.04^{***} (0.57)
Self-reflection	2.97^{***} (0.61)	3.77^{***} (0.58)
Self-efficacy	2.96^{***} (0.70)	3.66^{***} (0.50)
Strategic planning	2.73^{***} (0.66)	3.57^{***} (0.60)
Setting goals	2.69^{***} (0.62)	3.68^{***} (0.71)
Metacognitive strategies	2.59^{***} (0.59)	3.34^{***} (0.61)

$^{***} = p < .001$

Table 3. *Descriptive statistics of identified profiles in self-regulated learning (Independent sample T-test)*

Correlation with the willingness to use mobile learning resources

A second EFA with Varimax rotation was used to check the validity of the thirteen items regarding the willingness to use the listed mobile learning resources. KMO = .72 demonstrated that the sample size was sufficient to conduct a factor analysis (Beavers et al., 2019). Bartlett's test of sphericity $X^2(78) = 402.452$, $p < .001$ showed that the correlations between the items were large enough to perform the EFA (Field, 2017). The analysis showed that there were four latent factors with eigenvalues > 1 (Costello & Osborne, 2005), which together explained 58.17% of the variance. The items that clustered around the same component showed that three components were involved (factor loading > .50). For each scale, the items were checked for homogeneity (Cronbach's alpha > .60; Gliem & Gliem, 2003). The three variables were then summed to a score ranging from 3 (I would never use this) to 15 (I would use this daily). Table 4 summarizes the means and standard deviations of the variables used.

	M	*SD*	Cronbach's alpha	range
Willingness	7.5	1.55	.603	3 - 15
Component 1	3.44	0.74	.654	1 - 5
Component 2	2.04	0.62	.645	1 - 5
Component 3	2.02	0.70	.503	1 - 5

Table 4. *Descriptive statistics of used variables and scales of willingness to use mobile learning materials*

After conducting a t-test between the degree of willingness and the profiles in self-regulated learning, there was no significant relationship found. However, using a bivariate test with Pearson product-moment correlation coefficient, a weak positive relationship was found between the degree of willingness to use mobile resources and the teacher's overall score in mobile self-regulated learning (r = .169; p < .05; N=141). This suggests that the higher the score in self-regulated learning, the higher also the willingness to engage in mobile learning. Furthermore, a weak significant relationship with the scales of metacognitive learning strategies, self-reflection, concretization, and goal-setting (Table 5) was found. For all four scales, the higher the score in self-regulated learning, the higher the voluntary use of mobile learning tools.

Component	*r*
Self-reflection	.192*
Concretisation	.186*
Metacognitive strategies	.167*
Setting goals	.183*

* = p < .05

Table 5. *Correlations between the willingness to use mobile learning materials and the components in self-regulated learning (Pearson product-moment correlation coefficient)*

Conclusion

Profiles in teachers' mobile self-regulated learning (RQ1)

To address research question one, if and which profiles can be differentiated with teachers in self-regulated mobile learning, it can be concluded that two profiles in mobile self-regulated learning can be defined. The first profile is characterised by teachers who exhibit mobile self-regulated learning to an average degree, whilst the second profile describes teachers who exhibit mobile self-regulated learning to a high degree. Moreover, the score in mobile self-regulated learning is positively related to the willingness to use mobile learning tools.

From the overall score in mobile self-regulated learning, the respondents generally scored average to fairly high on the various self-regulated learning skills. In this regard, they score highest on metacognitive learning strategies, followed by self-efficacy and goal-setting. Moos and Ringdal (2012) argue that metacognitive strategies provide the learner with feedback, which helps them to self-regulate the learning process. This could partly explain the higher use of this skill. Additionally, Sitzmann and Ely (2011) argue that self-efficacy and goal-setting have a strong effect on an individual's learning outcomes. However, task

appreciation scored lowest, while similar motivation strategies would also produce higher performance according to Muwonge et al. (2020).

Correlation with the willingness to use mobile learning resources (RQ2)

The study examined if there is a relationship between primary school teachers' self-regulated learning and their willingness to engage with mobile learning resources. A positive correlation was found between the degree of willingness and the teachers' overall score in mobile self-regulated learning. The higher the score in self-regulated learning, the higher also the willingness to use mobile learning resources. Following Grant's (2019) call for linking research to the seven character traits of mobile learning, it can be said that learner engagement in the use of mobile learning resources is positively related to mobile self-regulated learning. Moreover, there appears to be a correlation with metacognitive learning strategies, self-reflection, concretization and goal-setting. The higher the use of these self-regulated learning skills, the higher the voluntary use of mobile learning tools. However, there appears to be no significant relationship between the level of willingness to use mobile learning tools and the profiles in self-regulated learning.

Finally, the analyses show that the higher the age of the respondents, the lower the willingness to use mobile learning tools. This can be explained by the results of Mirķe et al. (2019), which show that the willingness to use online learning is related to the respondent's self-concept of technology use. According to O'Bannon and Thomas (2014), teachers older than 50 show less mobile self-efficacy than younger teachers in using mobile devices. Furthermore, there is a positive relationship between age and technology stress (Özgür, 2020). In this regard, Philipsen's (2019) research shows that learners' technology engagement is mediated by the individual's digital capital. Lower self-confidence in technology use could be the underlying reason for lower readiness for mobile learning (Mirķe et al., 2019). This is an important side note, as the willingness to learn online shows a significant relationship with online learning outcomes (Wei & Chou, 2020) and higher self-concept determines the quality of self-regulated learning (Broadbent & Fuller-Tyszkiewicz, 2018; Sitzmann & Ely, 2011).

Limitations and future research

Even though this study contributes to the theoretical underpinning of the concept of teachers' mobile self-regulated learning, some limitations must be addressed. The first limitation is that using a questionnaire only provides a snapshot of teachers' professional learning, whereas self-regulated learning is a dynamic concept that can fluctuate and change over time (Severiens et al., 2001). Longitudinal research could better capture this, but this was not possible within the time frame of the current study. Additionally, it is necessary to examine the effect of teachers' mobile self-regulated learning on their classroom practice (Consuegra & Engels, 2016). Complementing quantitative results with qualitative research would provide useful insights that allow the translation of the research into practice (Butler, 2003; Vanslambrouck et al., 2019). Furthermore, it seems interesting to investigate which personal characteristics are correlated with teachers' mobile self-regulated learning and which interventions may have a positive or negative effect on teachers' mobile self-regulated learning.

The second limitation of the study concerns the rather limited sample size. Due to the low response rate, some items did not meet the requirements to be included in the scales (factor loading > .50). Partly for this reason, the exploratory factor analysis revealed fewer scales

than expected, which may be a consequence of the limited sample size. In addition, the distribution of the survey through social media might introduce bias as it is likely that specifically those respondents who were already using mobile learning tools were addressed.

A final limitation relates to the requirement to adapt the questionnaire to fit the target group. The SRLMQ (Littlejohn et al., 2016) was adapted because (1) no validated Dutch questionnaire exists and (2) existing questionnaires focus solely on formal online learning environments such as in the context of MOOCs, whereas the current study included also non-formal ways of mobile learning. Therefore, an exploratory factor analysis was chosen instead of a confirmatory factor analysis (Henson & Roberts, 2006; Yong & Pearce, 2013). To increase the reliability of the survey within the researcher's capabilities, a simplified version of Beaton et al.'s (2000) back-translation method was used, working with two independent translators. In future research, the validation of a Dutch questionnaire that can be applied within different mobile contexts would provide added value. This would allow similar research to be conducted with other Dutch-speaking populations. For instance, this questionnaire could be administered to teachers of other educational levels, as well as to students, pupils and in the business world to gain an insight into their mobile self-regulated learning. A subsequent recommendation is to study the relationship with learning outcomes. A first question here is whether a higher profile also produces more desirable learning outcomes. In the case of teachers, this could be related to the effect on student learning outcomes (see, e.g., Sancar et al., 2021). Thereby, the results of Peeters et al. (2014), which showed that teachers' self-regulated learning determines their students' self-regulated learning, could also be tested against teachers' mobile self-regulated learning.

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