

# Profiles of Readers in a Digital Age

*by* Nur Hidayanto Pancoro Sp

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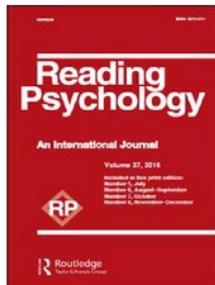
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## PROFILES OF READERS IN A DIGITAL AGE

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*This study examined typologies of young adults as readers in the digital age (N = 993). Latent profile analysis (LPA) results showed that across different modes (printed, online, and social media) and purposes (academic and recreational) of reading, four distinctive reader groups emerged: low-interest readers, traditional readers, moderate readers, and high-interest readers. While there was an absence of the group who may read exclusively online, people with a higher level of reading interest would read a lot, and those with a lower level of reading interest would not engage themselves in reading, irrespective of different types of reading modes.*

The pace of development in today's digital age has rendered obsolete much of the previous research on students' reading behaviors. Before the advent of the Internet, research on reading behaviors understandably focused on printed texts, whereas today the Internet and online texts are the predominant sources of reading for many young people (Bibby, Russell, & Rolheiser, 2009; Liu, 2005). Accordingly, the extant research literature on reading does not necessarily reflect the reality of how young people read today. Key questions include whether and to what extent young readers have become exclusively online readers, and whether and to what extent their interest in reading printed texts has been sustained relative to their interest in reading online.

Failure to take sufficient account of the mode of reading might explain some mixed results about students' reading behaviors during the transitional period from printed to online texts. For example, a substantial decline in students' interest in

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reading has been reported in many countries (OECD, 2011), including the United States (US-National Endowment for the Arts Research Division, NEA, 2004), the United Kingdom (Sainsbury & Schagen, 2004), and the Netherlands (Phillips, 2010). At the same time, an increase in reading behavior has been reported in studies that focused on reading online newspapers and online magazines (Karim & Hasan, 2007; Liu, 2005) or social media platforms such as *Facebook* and *Twitter* (Junco, 2012; Kirschner & Karpinski, 2010; Smith & Caruso, 2010). It can be inferred that studies reporting a decline in reading interest (NEA, 2004; Phillips, 2010; Sainsbury & Schagen, 2004) examined students' reading of *printed materials*, while studies showing a rise in reading interest analyzed multiple modes of reading such as printed texts, online texts, and texts in social media (Junco, 2012; Karim & Hasan, 2007; Liu, 2005).

The aim of the present study was to examine latent profiles/classes of undergraduate students based on their reading interest across different modes and different purposes of reading. The reading interest dimensions identified in Putro & Lee (2017) were used as the main constructs in this investigation. This classificatory scheme includes a wide range of constructs related to the behavioral dimensions of undergraduate students' reading, namely, mode, purposes, and psycho-behavioral aspects. The findings were expected to shed light on the important question of how young students read today.

### Latent profiles of readers

There is wide variation in the aspects of reading that have been used to classify types of readers in different studies. For example, van Rees, Vermunt, and Verboord (1999) examined reading behaviors based on one-week diary data collected from 3500 Dutch students aged 12 or older, and identified four types of readers: a small group (4%) of omnivorous readers who mainly read magazines and popular/regional newspapers; high-brow readers (15%) who like to read quality papers, literary books, and opinion magazines; lowbrow readers (13%) who read family magazines, popular books, and popular/regional

newspapers; and nonreaders (67%) who generally do not read much except for popular books and popular/regional newspapers. On the other hand, a study of the extracurricular reading behaviors of 1226 German secondary school students (Pfof, Dörfler & Artelt, 2013) identified five groups of readers based on the amount of time spent on reading print or online texts: highly engaged readers who like to read both print and online texts; moderate readers who reported spending a moderate amount of time reading both printed and online texts; online readers who read mainly online texts; print readers who reported reading mainly printed texts; and print avoidant-readers whose reading behavioral pattern resembled that of online readers but who read less than this group in both printed and online spaces.

In another line of research, Applegate and his colleagues (Applegate & Applegate, 2004; Applegate et al., 2014) used attitudes towards reading to identify different types of readers among undergraduate students (preservice teachers) in the United States. They identified two types of readers: enthusiastic readers, who are highly engaged in a broad range of reading, and unenthusiastic readers, who take little or no pleasure in reading.

A more comprehensive set of variables related to reading behavior was employed in a recently published study by Putro & Lee (2017), in which undergraduate students' reading patterns were examined in relation to reading modes (print, online, and social media), reading purposes (academic and recreational), and psycho-behavioral aspects of reading (elaboration, enjoyment, competence experience, perceived utility value, confidence, flow, and sense of belonging). The results demonstrated that certain psycho-behavioral aspects of reading occurred in particular reading modes or reading purposes, suggesting that reading behaviors may be represented by the following 15 constructs: (1) *elaboration in reading in print settings*; (2) *enjoyment in reading in print settings*; (3) *competence experience in reading in print settings*; (4) *perceived utility value in online reading*; (5) *confidence in online reading*; (6) *enjoyment in online reading*; (7) *competence experience in online reading*; (8) *flow in online reading*; (9) *sense of belonging in social media*

reading; (10) enjoyment in social media reading; (11) enjoyment in academic reading; (12) competence experience in academic reading; (13) flow in academic reading; (14) elaboration in recreational reading; and (15) enjoyment in recreational reading. This means, for example, that sense of belonging was manifested in reading in the social media context, while flow in reading was observed in reading in the online setting or reading for academic purposes. The authors concluded that the 15 constructs sufficiently represent reading behaviors of young people today and can be used to identify different types of readers and to examine people's approach to reading in various reading contexts.

Given the absence of consensus or clear direction in the conceptualization of different types of readers, coupled with the relative lack of research attention to current practice of reading behaviors, the present study set out to identify latent profiles that can sufficiently represent young people in this digital age. In order to include as many aspects of reading as possible, we employed the reading behavior constructs that were identified in Putro & Lee (2017). Hence the present study investigated a broad range of psycho-behavioral variables related to reading (e.g., enjoyment, utility value) in the contexts of different reading modes (print, online, social media) and different purposes of reading (academic or recreational context).

## Method

### *Participants*

Data were collected from responses to an online survey completed by a sample of undergraduate students attending an Indonesian university ( $N=993$ ). The research instrument was the Reading Interest Measure used in the study by Putro & Lee (2017), where the sampling strategy is described. The demographic characteristics of the sample were as follows: 71% were female; 80% were in sophomore and junior years; 46% were majoring in languages and arts (46%) and 18% in education; 37% and 36%, respectively, reported fathers' education at a senior high school level or beyond (i.e., university).

### Measures

All 51 items in the Reading Interest Measure of reading behaviors and reading interest employed a 5-point Likert-type response category, ranging from *strongly disagree* (1) to *strongly agree* (5) with *neither disagree nor agree* (3) at the middle point. The survey measured the 15 reading-related constructs described earlier, and each scale representing the 15 constructs showed Cronbach's  $\alpha$  values ranging between .76 and .95. A detailed discussion of all 51 items and reliabilities of each scale is provided in Putro & Lee (2017).

The survey collected demographic information (gender, university major, year level, parental education, employment status, living arrangements, and self-reported socio-economic status (SES)). It also included two items on students' experience of education: self-reported grade point average (GPA) and self-expectation of highest education attainment (finishing an undergraduate degree, Master's degree, PhD degree, or other).

### Statistical analysis

Latent profile analysis (LPA) was used to examine typologies of readers. LPA was performed to identify the best representation of subgroups of readers based on their psycho-behavioral tendencies toward reading. The conventional model fit indices that are typically employed in LPA were employed in the present study. These were: the Akaike's Information Criterion (AIC), Bayesian Information Criterion (BIC), sample size adjusted BIC (adj-BIC), Vuong-Lo-Mendel-Rubin likelihood ratio (VLMR-LR), and Lo-Mendell-Rubin likelihood ratio (LMR-LR). Smaller values of AIC, BIC, and adj-BIC are more desirable (i.e., better fit to the data) and are generally preferred. In the evaluation of values obtained from VLMR-LR and LMR-LR, a non-significant  $p$ -value of the LMR-LR test (i.e.,  $p < .05$ ) indicates that there is no significant improvement in the model fit in the  $k$ -class model in comparison to the lower ( $k-1$ ) class model. In that case, rejection of the  $k$ -class model is recommended in favor of a model with a smaller number of

classes such as  $k-1$  classes. In addition, as in the interpretation of factor analysis, substantive interpretation of sub-classes with distinguishable features of each class is also an important criterion in drawing conclusions about the final LPA model for a given data set (see Wang & Wang, 2012, p. 293). Subsequent to LPA, ANOVA and chi-square tests were performed to further examine characteristics of latent profile classes in terms of their demographic and educational variables.

## Results

### *Reader profiles based on latent profile analysis (LPA)*

Table 1 presents descriptive statistics of all 15 reading-related variables employed in the present study.

Table 2 shows the LPA results containing model fit indices of classes 1–7. The LPA results showed that a four-class model would be the best representation of the data based on the psychometric criteria listed above as well as subjective interpretations about the emerged classes as distinctive groups of readers. For instance, the 5-class model showed a  $p$ -value of .30 in the LMR-LR test, which suggests rejection of the hypothesis that the 5-class model is a statistically better fit to the data than the 4-class model. On the other hand, the 4-class model was a statistically significant improvement ( $p = .04$ ), compared to the 3-class model. The 3-class model showed a better fit than the 2-class model, which was again a better fit than the 1-class model. The AIC, BIC, and adjusted BIC indices showed that the 4-class was the best among the four models. There was little variation in entropy among all seven tested models.

The substantive interpretations of classes of readers can be explained by the mean values of each of the 15 variables used in the LPA. Figure 1 presents a line chart plotting the mean values of the latent variables (i.e., profiles)<sup>1</sup> of each class based on the 4-class solution.

<sup>1</sup>ANOVA was used to examine the statistical differences on each of the 15 variables across the four classes. The ANOVA and Scheffe post-hoc group comparison test results showed that the groups differed from each other on most of the 15

**TABLE 1** Descriptive Statistics of the Variables Employed in the Present Study ( $N=993$ ).

Variables		Standard		
		Means	deviation	Min Max
ELA_P	Elaboration in reading in print settings	0	0.60	-2.42 1.19
ENJ_P	Enjoyment in reading in print settings	0	0.69	-3.17 1.24
COM_P	Competence experience in reading in print settings	0	0.74	-2.24 1.69
VAL_O	Perceived Value in online reading	0	0.51	-1.62 1.20
CONF_O	Confidence in online reading	0	0.70	-2.01 1.61
ENJ_O	Enjoyment in online reading	0	0.83	-2.12 1.87
COM_O	Competence experience in online reading	0	0.74	-1.86 2.05
FLW_O	Flow in online reading	0	0.84	-1.66 1.89
BEL_S	Sense of belonging in social media reading	0	0.73	-2.47 1.44
ENJ_S	Enjoyment in social media reading	0	0.64	-1.82 1.47
ENJ_A	Enjoyment in academic reading	0	0.79	-2.47 1.56
COM_A	Competence experience in academic reading	0	0.73	-2.39 1.49
FLW_A	Flow in academic reading	0	0.72	-1.88 2.00
ELA_R	Elaboration in recreational reading	0	0.65	-2.57 1.28
ENJ_R	Enjoyment in recreational reading	0	0.82	-2.68 1.19

Notes: ELA\_P: Elaboration in print settings

ENJ\_P: Enjoyment in print settings

COM\_P: Competence experience in print settings

VAL\_O: Utility value in online reading

CONF\_O: Confidence in online reading

ENJ\_O: Enjoyment in online reading

COM\_O: Competence experience in online reading

FLW\_O: Flow in online reading

BEL\_S: Sense of belonging in social media reading

ENJ\_S: Enjoyment in social media reading

ENJ\_A: Enjoyment in academic reading

COM\_A: Competence experience in academic reading

FLW\_A: Flow in academic reading

ELA\_R: Elaboration in recreational reading

ENJ\_R: Enjoyment in recreational reading.

Means are zero because they are factor scores with a mean of zero.

constructs, with several exceptions (i.e., no statistical differences between Class 2 and Class 4 on enjoyment of reading in print setting and flow in academic reading and between Class 1 and Class 2 on confidence in online reading, enjoyment of online reading, competence experience in online reading, flow in online reading, and enjoyment of social media reading).

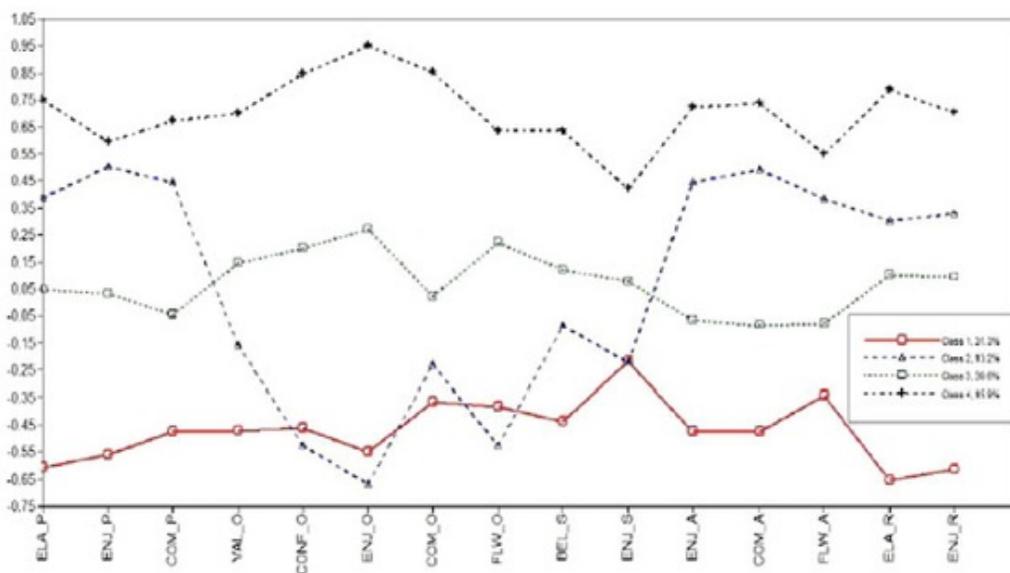
**TABLE 2** Goodness of Data Fit based on Latent Profile Analysis ( $N=993$ ).

Number of class	Vuong-Lo-Mendel-Rubin	Lo-Mendel-Rubin	AIC	BIC	Adjusted BIC	Entropy
1	–	–	32068.51	32215.53	32120.25	–
2	0.00	0.00	28697.62	28923.06	28776.96	0.87
3	0.00	0.00	27462.19	27766.03	27569.12	0.88
4	0.04	0.04	26938.43	27320.69	27072.96	0.87
5	0.29	0.30	26498.33	26959.00	26660.45	0.86
6	0.21	0.21	26166.96	26706.04	26356.68	0.86
7	0.75	0.75	25917.04	26534.53	26134.35	0.86

Notes. AIC = Akaike information criterion

BIC = Bayesian information criterion

AdjustedBIC = Adjusted Bayesian information criterion.

**FIGURE 1** Latent profiles of readers.

Notes. ELA\_P: Elaboration in print settings; ENJ\_P: Enjoyment in print settings; COM\_P: Competence experience in print settings; VAL\_O: Utility value in online reading; CONF\_O: Confidence in online reading; ENJ\_O: Enjoyment in online reading; COM\_O: Competence experience in online reading; FLW\_O: Flow in online reading; BEL\_S: Sense of belonging in social media reading; ENJ\_S: Enjoyment in social media reading; ENJ\_A: Enjoyment in academic reading; COM\_A: Competence experience in academic reading; FLW\_A: Flow in academic reading; ELA\_R: Elaboration in recreational reading; ENJ\_R: Enjoyment in recreational reading.

As can be seen in Figure 1, there appear to be four distinctive groups. Class 1, labeled as “low-interest readers,” comprised 31% of the sample ( $n=310$ ) and was characterized by low levels of all aspects of reading behaviors across different

modes of reading (print, online, and social media), for different purposes of reading (academic and recreational), and for different psycho-behavioral aspects of reading. The only aspect of reading that stood out from the others as positive was “enjoyment of reading in the social media reading context,” which was at the same level as in Class 2.

Class 2, labeled as “traditional readers,” comprised 13% of the sample ( $n=131$ ) and was characterized by high reading interest in print settings and for academic reading and recreational reading but low reading interest in online reading and social media reading. This group showed a clear pattern of “traditional” reading; they showed no interest in reading online or in the social media context, while their interest in reading printed texts or for academic/recreational purposes was the second highest among the four classes.

Class 3 had the largest number of students ( $n=394$ , 39%), showing moderate levels of reading interest across all 15 aspects. The group’s mean scores on all 15 constructs were in the middle range (i.e., around the mean score of 0), hence this group was labeled “moderate readers”. Class 4, which comprised 16% of the sample ( $n=158$ ), was distinguished by high levels of reading interest across all 15 aspects of reading. They were labeled as “high-interest readers”. The mean values of all 15 variables were higher than those of the other three groups. In this group, aspects of online reading (i.e., confidence in online reading, enjoyment in online reading, and competence experience in online reading) were particularly high and higher than the other reading variables.

In sum, Class 1 showed low interest in both printed and online reading. Class 2 showed a lack of reading interest in the online and social media platforms but had a relatively high interest in traditional reading settings. Class 3 had moderate levels of reading interest across both printed and online reading settings. Class 4 showed high levels of reading interest across both printed and online reading settings.

#### *Latent profile groups and demographic variables*

The person-class assignment was generated as part of the LPA output and the results of class membership were transferred to

the SPSS program for further analyses. Chi-square tests were conducted to examine whether there were statistical differences in the four latent classes in terms of the demographic variables (gender, university major, university year level, parental education, employment status, living arrangements, and self-reported SES). Most of the chi-square group comparison tests showed no statistical differences in the four latent classes by the demographic variables. Exceptions were found in relation to university year levels ( $\chi^2[9, N=993] = 19.27, p < .05$ ), which revealed a statistically significantly higher proportion of junior year students in Class 2 ( $n=53$ ), compared to freshmen ( $n=1$ ) and senior year students ( $n=13$ ). Another statistically significant difference was found by students' major ( $\chi^2[18, N=993] = 38.62, p < .001$ ), such that the proportion of students in the Faculty of Languages and Arts ( $n=205$ ) was greater than the proportion of students in the Faculty of Social Sciences ( $n=38$ ) in Class 3. No other significant group-differences were found in relation to the other demographic variables.

#### *Latent profile groups and education-related variables*

The research participants were asked about their self-expectation of the highest level of their own educational attainment. The responses were as follows: finish an undergraduate degree (23%), Master's degree (40%), PhD degree (36%), and other (1%). A chi-square test, followed by post-hoc tests, showed that Class 1 ("low-interest readers") had a statistically significantly greater proportion of students ( $n=95$ ) who reported self-expectation of only completing an undergraduate degree than the proportion of the students who reported to plan to study for a Master's degree ( $n=118$ ) or for a PhD degree ( $n=97$ ). In contrast, Class 4 ("high-interest readers") had a significantly higher proportion of students planning to study for a PhD degree ( $n=74$ ) than those who reported wishing to finish schooling after their undergraduate degree ( $n=21$ ). No other significant differences were found in latent classes by self-expectations of educational attainment.

Another education-related variable examined in this study was academic achievement, measured by self-reported GPA. A

one-way ANOVA was performed to examine whether students' GPA would differ in the four latent classes of readers. A significant difference in students' GPA was found in the omnibus test ( $F[3, 976] = 4.30, p = .005, \eta^2 = .01$ ). The post-hoc analysis showed that Class 2 ("traditional readers") reported higher GPAs ( $n = 121, M = 3.43, SD = .28$ ) than Class 1 ("low-interest readers") ( $n = 310, M = 3.34, SD = .28$ ). No other significant differences were found in students' GPA across the four latent classes of readers.

### Discussion

The overall purpose of this investigation was to examine reader profiles in the digital age, where most readers are engaged in multiple modes of reading such as print, online, and social media. By employing LPA, which adopts a person-centered approach, this study identified four types of readers: low-interest readers, traditional readers, moderate readers, and high-interest readers. Low-, moderate-, and high-interest readers were distinguished by different levels of reading interest (low, moderate, and high), suggesting that readers differ in terms of their level of reading interest, and that the pattern of reading interest (low, moderate, and high) tends to be consistent in three different modes of reading (print, online, and social media). For instance, people who show great interest in reading printed texts would also have great interest in reading online, and people who have little interest in reading printed texts would not have great interest in reading online either. The only group that deviated from the consistent reading pattern across different modes is "traditional readers", who showed higher interest in reading than "moderate readers" in all dimensions except for reading in online or social media settings.

As noted earlier, Pfost et al. (2013) identified five types of readers (highly engaged readers, moderate print and online readers, traditional print readers, online readers, and print avoidant readers). Only the first three types of readers were identified in the present study, and there was a stronger presence of online readers in the German study. The different results between the two studies may be attributed to the sample

characteristics – German secondary school students versus Indonesian university students. Specifically, the online environments for student learning and reading differ in these two countries in relation to the availability, quality, coverage, and speed of the Internet and how effectively and extensively online resources are used in the schools (ITU, 2016; OECD, 2012). In Indonesian universities, textbooks and printed reading materials are still the primary sources of reading, while online materials are used as supplementary reading. In this context, the absence of exclusively online readers in the present study is not surprising; the reader profiles showed a reading pattern for young generations in developing countries where exclusively online readers have not yet emerged. Online avoidant readers clearly show low interest in online or social media reading while maintaining high interest in reading in traditional, print-text settings. The other three groups (low-, moderate-, and high-interest groups) also showed that their reading interest was not exclusively focused on reading in the online or social media contexts because their interest in reading was rather consistent (see Figure 1) across the 15 aspects and modes of reading (with a slight upturn in online reading).

Other researchers have reported that some students show strong preference for reading printed materials over online reading (e.g., Hooper, 2012; Liu, 2005, 2006). It has also been reported that students choose a particular type of reading mode depending on their reading purposes. That is, students prefer to read in print settings when the activity requires in-depth and careful thought, whereas the online mode is used for broader reading and to browse or search for information (Liu, 2006). Social media reading is even further removed as a reading activity itself (Putro & Lee, 2017), as its main use being a means of building and strengthening social connections (Boyd & Ellison, 2007). Given that the present study was based on a sample of undergraduate students, their preference for printed text materials may be related to the academic reading requirements of their coursework. Several problematic issues associated with computer-based reading have also been identified. These include screen resolution (e.g., Sandberg, 2011), eye-strain and fatigue (Berg, Hoffmann, & Dawson, 2010;

Kauffman, Zhao, & Yang, 2011), font types and sizes (e.g., Bernard, Liao, & Mills, 2001; Larson, 2007), and exposure to potential distractions such as pop-ups and advertisements (Liu, 2006), all of which might contribute to a preference for reading printed texts over reading online.

It can be indirectly inferred from the findings of the current study that students' interest in reading may not have declined as severely as has been reported in previous studies (NEA, 2004; Phillips, 2010). In the digital age, people use multiple sources and modes of reading. The increasing trend towards online and social media reading means that these are becoming more important sources of reading than ever (Huang et al., 2014; Karim & Hasan, 2007; Mokhtari et al., 2009). Future research needs to incorporate a wide range of reading modes and reading settings if it is to generate an accurate picture of students' reading interest and reading-associated behaviors.

The current study provided limited information about the relationships between different classes of readers and socio-demographic characteristics. One finding of this study, related to students' demographic characteristics, was about their year level in the university. There was a higher proportion of junior year students in Class 2 ("traditional readers"), which was a rather unexpected result. A possible explanation can be found in previous studies which suggested that students in their freshmen year tend to read less, study less, and write less than students in their junior year due to the transition to university studies (e.g., Kuh, 2005; Kuh, 2007). By their senior year, however, students have become more skillful in learning from multiple sources and are not as heavily reliant on traditional reading materials such as textbooks (Moreno et al., 2012).

A more substantively meaningful result was found in relation to the education variables. Specifically, a greater number of students in the "high-interest readers" group reported that they were planning to pursue a PhD compared to those who reported no plans for further study after their undergraduate degree. The pattern was reversed among the "low-interest readers". In addition, GPA was higher among "traditional readers" than among "low-interest readers". Given that academic

achievement is closely related to reading ability (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012; Hughes-Hassell & Rodge, 2007), this pattern was expected: the higher the level of academic achievement, the greater the interest in reading. Students who had self-expectations of pursuing a higher degree were likely to read more and show interest in reading, in general, to enhance their knowledge and academic skills. It is known that continuation of education beyond an undergraduate degree is strongly related to academic achievement (e.g., GPA) in undergraduate programs (Mullen, Goyette, & Soares, 2003; Stolzenberg, 1994). Furthermore, undergraduate students who read more are likely to produce better academic results than those who are reluctant to read (Baron, 2015; Liu, 2005; Mangen, Walgermo, & Brønneck, 2013; Pretorius, 2002; Pretorius & Mampuru, 2007; Tanner, 2014). The reader profiles that were found in this study could be used to increase students' self-awareness of their own preferences in relation to their reading modes, which could potentially facilitate their further engagement in reading activities.

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