The Relationship of College Students' Network Reading and Learning Engagement, Reading Understanding Metacognitive Strategies and Independent reading Ability

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Abstract: This paper uses the undergraduates learning engagement scale (UWES-S) in Chinese version which was revised by Xi-ying Li teacher, and Reading Comprehension Metacognition Questionnaire made by Mokhtari2002, and Independent Reading Ability Questionnaire made by Qi Guo to investigate in 319 university students from the first grade to the third grade. The purpose is to understand the present situation of learning investment, reading comprehension metacognitive strategy and independent reading ability for college students, and influence of factors such as grade, gender, urban and rural employment intention on reading comprehension metacognitive strategies and self reading ability of learning involvement. Conclusion: Overall, college students have been in a medium condition for learning engagement, reading comprehension metacognitive strategy and independent reading ability. College students in the second grade have been in a minimum level for learning engagement, those in a junior and the third were higher than sophomore. Women are higher than the male for learning engagement level. Graduate students are higher than other employment intention of College students for learning engagement level. The factor of grade has significant impact on the deep reading ability and active reading ability, independent reading ability for the high grade students is higher than those low grade students. Grade and graduation intent have significant interaction effects on "motivation" and "self reading ability". The factors such as grade and the urban and rural have significant interaction effect in the "energy", "problem solving strategy" and "deep reading ability". Urban and rural and graduation intention only exists significant interaction effect in the "deep reading ability" score. Learning engagement and reading comprehension and metacognitive strategies and self reading ability of college students are high mutually correlation.

Keyword: Network reading；Independent reading ability；Learning engagement；Reading comprehension metacognitive strategy

1. Introduction

With the development of information technology, gradually from the traditional "reading time" into modern "screen reading era", network reading interpret the images gradually become the main way of reading to college students. Network reading is a kind of digital information text to the computer and accessory equipment loads relying on network technology, multimedia computer technology, and mobile communication technology. Network reading is hypertext reading behavior style of a complete meaning construction through the human-computer

interaction, read and acquiring all kinds of multimedia information resources including text, image (Ahao-xing Xia, 2011). The visualization text contents on a network helps to construct rich visual spatial mental representation and promote understanding of the text (De Koning, B. B., et al, 2013). The reader adopts different reading strategies according to the context of the different (Bowey J A., 1984). Readers with high and low reading ability use different reading strategies, showing different characteristics of eye movement (Gegenfurtner A., et al, 2011). Visual perception and visual information processing speed, visual memory and visual - verbal associative ability may be important cause of children's reading achievement differences arising (Yang Ling-Yan., et al, 2013).

Network reading is a double-edged sword, on the one hand "network reading" focusing on pictures, reading is perceived as the reading mode for obtaining the outline of the story, helping students to improve their reading comprehension ability. On the other hand, the College Students with Internet addiction is also easy to cause the students perceptual impetuous attitude toward reading (Qi Guo, 2009; Hong-jian Pan, 2009; Su-zhou Liu, 2012). Nowadays entertainment network reading has become one of the main contents of the current college students life, it is unknown whether it will affect the students reading comprehension metacognitive strategy and whether to affect the level of College Students' learning engagement. Autonomous learning is a main way of learning of the university students; it is unknown for network reading for entertainment whether it will affect the students' autonomous reading ability.

Based on this, this paper intends to explore the relationship between entertainment network reading, and learning engagement, reading comprehension metacognitive strategy and independent reading ability with grade referring to reading time.

2. Method

2.1 Subjects

Three hundred and nineteen undergraduate students (263 female and 56 male), with age 18-22 year old, average 19.25 years old , participated in the study selected by the random sampling method. All subjects were normal or corrected to normal vision. The specific situation of the respondents is shown in table 1.

Table 1 the investigation object distribution table (N=319)

Demographic variables	Category	Frequency
Grade	The first grade	203
	The second grade	57
	The third grade	59
Employment intention	Work	229
	Entrance	64
	Other	26
Gender	Male	56
	Female	263
Urban and rural	Rural	241
	Town	78

2.2 The research instruments

2.2.1 Learning Involvement Scale

Abroad Learning Engagement Scale (the Utrecht Work Engagement Scale-student, abbreviated as UWES-S) is developed by Schaufeli et al. Learning Engagement scale for this study is Chinese version of undergraduates learning engagement scale(UWES-S) revised based on this by Xi-ying Li teacher (Gegenfurtner A., et al, 2011). The scale contains 17 questions, divided into motivation, energy, focus on a total of three dimensions; the items of dimensions were respectively 6, 6, 5, a total of 17 items. The alpha coefficient of total scale is 0.919, the alpha coefficient of motivation subscale is 0.857, the alpha coefficient of energy is 0.826, and the alpha coefficient of focus is 0.815. The scale was scored by 7 grades, ranging from "never", "hardly ever", "little", "sometimes", "often", "very often" to "always", referred to as 1 - 7, are positive score. This scale has a good reliability and validity through analysis.

2.2.2 Reading comprehension metacognitive strategy scale

"Reading comprehension metacognitive strategy scale" Survey of Reading Strategies (SORS) used for investigation was made by Mokhtari in 2002 (Mokhtari & Sheorey，2002). Questionnaire is consists of 30 items, using Liken 5 scale method, 1 represents "I never do or think so"; 2 represents "I occasionally, rarely do or think so"; 3 represents "I sometimes do or think so, when 50% do so;" 4 represents "I often do or think so"; 5 represents "I always do or think so".   Your answer is very important to us; they are recorded as 1-5 points, and all positive score.

There are 13 questions for the overall reading strategies (GLOB), mainly using to investigate the goal setting in process of students reading, and 8 questions for the problem solving strategy (PROB), aiming to solve the problems in the process of revision strategies and reading situation.

The last 9 questions of support reading strategies (SUP) are aim to continue to make the response as reading supporting mechanism or tool.

2.2.3 Independent reading ability scale

Independent reading ability scale to use for investigation is made by Qi Guo. The scale used 5 point scoring, including three dimensions: self reading ability includes the ability to choose literature, ability of active ability of professional learning and cultivation of self cultivation. Deep reading ability includes understanding the literature content and the ability of digestion and the ability of using knowledge. The ability of active reading includes the ability to cultivate good reading habits and grasping scientific reading methods.

2.3 Data analysis model

Since entering the University, network reading for college students has become their main entertainment and lifestyle. This study assumes the grade as reading time for the network.

Analysis of variance model by custom, the main effect of grade, gender, urban and rural employment intention, four factors were analyzed, and the grade and gender, grade, gender and urban and rural and urban and rural, urban and rural areas and the employment intention of the interaction effect, focuses on several problems as follows:

(1) The general situation of the college students' learning engagement.

(2) The general situation of the college students' reading comprehension metacognitive

strategies.

(3) The general situation of College Students' Independent reading ability.

(4) Whether do effects of factors such as grades, gender, urban and rural students, and the employment intention of College students exist different in learning engagement.

(5) Whether are there differences in reading comprehension metacognitive strategy for the factors such as different grades, gender, urban and rural students, and the employment intention of college students.

(6) Whether are there differences in independent reading ability of different grades, gender, urban and rural students, and the employment intention of College students.

(7) Whether do different gender students have different learning engagement performance because of different employment intention, town or village.

(8) Whether do different gender students have different reading comprehension metacognitive strategies performance because of different employment intention, town or village.

(9) Whether do different gender students have different independent reading ability performance because of different employment intention, town or village.

3. Statistical data and the result analysis

3.1 Different gender, grade, urban and rural areas and the employment intention of College Students' learning engagement score of each dimension scales

The titles contained each dimension are scored with the 7 level score, uses SPSS18.0 to carry on the description statistical. The grade of learning engagement of each scale score of mean value and standard deviation are shown in table 2.

Table 2 college students' learning engagement score of each dimension of mean value and standard deviation

Sources of variation		Statistic	Motivation	Energy	Absorbability
Grade	1	M	27.26	22.29	18.94
		N	203	203	203
		SD	5.324	4.658	4.133
	2	M	24.61	20.91	18.39
		N	57	57	57
		SD	6.005	5.875	4.836
	3	M	27.39	21.83	18.68
		N	59	59	59
		SD	6.094	5.449	4.505
Gender	Male	M	23.36	19.95	17.41
		N	56	56	56
		SD	6.311	6.148	4.880
	Female	M	27.55	22.38	19.09
		N	263	263	263
		SD	5.254	4.693	4.150
Urban and rural	Town	M	25.85	21.21	18.46

		N	78	78	78
	Rural	SD	5.911	5.038	4.625
		M	27.12	22.20	18.90
		N	241	241	241
		SD	5.571	5.046	4.230
Employment	Work	M	26.76	21.84	18.65
intention		N	229	229	229
		SD	5.505	4.842	4.092
	Entrance	M	27.83	22.94	19.89
		N	64	64	64
		SD	5.935	5.252	4.814
	other	M	24.73	20.58	17.38
		N	26	26	26
		SD	6.090	6.087	4.648
	Total	M	26.81	21.96	18.79
		N	319	319	319
		SD	5.673	5.054	4.326

As is depicted in the table 2, we can see that College Students in the second grade get the lowest score of each dimension, especially in motivation. The scores of freshman due to just the entrance and Junior since graduation, were all higher than sophomore. Female college students are better than male college students in the aspect of learning engagement. Rural students are better than urban students in the aspect of learning engagement. College students with academic goals are better than those with planning to work in the aspect of learning engagement. Meanwhile college students with planning to work are better than those with other intention.

3.2 The variance analysis results of factors such as gender, grade, urban and rural areas and employment intention in learning engagement

Table 3 The variance analysis results of learning engagement scale and its each dimension

Dimension / Sources of variation	Motivation	Energy	Absorbability
Grade	5.363**	1.673	.390
Gender	9.786**	6.657**	4.682*
Urban and rural	1.107	.562	.005
Employment intention	2.957	3.413*	1.373
Grade ＊ Urban and rural	2.208	4.404*	2.646
Grade ＊ Employment intention	3.366**	2.083	1.817
Grade ＊ Gender	.097	.330	.241
Urban and rural ＊ Employment intention	.188	.827	.369
Urban and rural ＊ Gender	.263	.708	1.029

		.639	1.526	.727
Employment intention ∗ Gender				

Note: the figures in this table are the results of the analysis of variance of F value; * * indicates significant at the level of.01, * indicates significant at the.05 level. The same as below.

As are seen from table 3, the grade factor has significant impact on the "motivation", but has no significant effect on the "energy, focus on". Gender had significant influence on "motivation, energy, and focus on". The factor of urban and rural does not significantly influence on "motivation, energy, focus on". The factor of employment intention has significant impact on the "energy", and has no significant influence on "motivation, focus on ". The grade factor has remarkable main effect on the "motivation", and gender factor has remarkable main effect on "motivation, energy, focus on", and the employment intention only in the "energy" exists significant main effect yet. Grade and graduation intention only exists significant interaction effect in the "motivation" score. Grade and urban and rural only have significant interaction effect in the "energy" score.

The grade and gender, urban and rural and employment intention, urban-rural and gender, employment intention and gender have no significant interaction effect on different dimensions of learning engagement.

3.3 Different gender, grade, urban and rural areas and the employment intention of College Students' reading comprehension metacognitive strategy score of each dimension scales

Table 4 college students' reading comprehension metacognitive strategy score
of each dimension of mean value and standard deviation

Sources of variation		Statistic	GLOB	PROB	SUP
Grade	1	M	40.80	25.50	28.54
		N	203	203	203
		SD	7.646	5.540	5.467
	2	M	39.65	26.42	28.96
		N	57	57	57
		SD	6.629	5.487	5.206
	3	M	41.49	24.75	27.80
		N	59	59	59
		SD	9.280	6.263	7.097
Gender	Male	M	38.48	25.52	27.54
		N	56	56	56
		SD	6.102	5.180	4.744
	Female	M	41.20	25.52	28.68
		N	263	263	263
		SD	8.050	5.784	5.932
Urban and rural	Town	M	39.49	25.97	28.00
		N	78	78	78
		SD	7.844	6.231	5.737

	Rural	M	41.12	25.38	28.63
		N	241	241	241
		SD	7.766	5.489	5.759
Employment intention	Work	M	41.06	25.31	28.62
		N	229	229	229
		SD	7.380	5.267	5.360
	Entrance	M	40.58	26.86	28.88
		N	64	64	64
		SD	8.766	5.922	6.184
	other	M	38.12	24.08	26.27
		N	26	26	26
		SD	8.728	7.818	7.529
	Total	M	40.72	25.52	28.48
		N	319	319	319
		SD	7.804	5.675	5.751

3.4 The variance analysis results of factors such as gender, grade, urban and rural areas and employment intention in reading comprehension metacognitive strategy

Table 5 the variance analysis results of College Students' reading comprehension metacognitive strategy of scores and its each dimension

Dimension / Sources of variation	GLOB	PROB	SUP
Grade	.260	1.171	.638
Gender	.451	.916	2.623
Urban and rural	.460	1.755	.141
Employment intention	1.225	1.217	1.821
Grade ∗ Urban and rural	.356	3.030*	.261
Grade ∗ Employment intention	2.102	1.481	1.901
Grade ∗ Gender	1.697	.496	2.834
Urban and rural ∗ Employment intention	.480	1.137	.782
Urban and rural ∗ Gender	.001	.212	.629
Employment intention ∗ Gender	1.045	.455	1.335

As is depicted in table 5, the factors such as visible, grade, gender, urban and rural areas and employment intention have no significantly influence on all dimensions of reading comprehension metacognitive strategy. Grade and urban and rural only have significant interaction effect in "problem solving strategy" score. Grade and graduation intention, grade and gender, urban and rural and graduation intention, urban-rural and gender, graduation intention and gender have no significant interaction effect in reading comprehension metacognitive strategies and its different dimensions.

3.5 Different gender, grade, urban and rural areas and the employment intention of College Students' independent reading ability score of each dimension scales

Table 6   college students' independent reading ability score
of each dimension of mean value and standard deviation

Sources of variation		Statistic	Independent reading ability	Deep reading ability	Active reading ability
Grade	1	M	17.98	16.33	17.78
		N	203	203	203
		SD	3.008	2.616	3.167
	2	M	18.40	16.74	19.09
		N	57	57	57
		SD	3.327	3.260	3.147
	3	M	18.07	16.95	17.97
		N	59	59	59
		SD	2.988	2.655	3.414
Gender	Male	M	17.88	15.93	18.29
		N	56	56	56
		SD	3.527	3.346	3.581
	Female	M	18.11	16.64	18.00
		N	263	263	263
		SD	2.954	2.598	3.165
Urban and rural	Town	M	17.42	16.10	17.79
		N	78	78	78
		SD	3.177	3.031	3.473
	Rural	M	18.28	16.65	18.13
		N	241	241	241
		SD	2.995	2.648	3.161
Employment intention	Work	M	18.08	16.41	17.90
		N	229	229	229
		SD	2.933	2.509	3.188
	Entrance	M	18.16	16.97	18.33
		N	64	64	64
		SD	3.306	3.271	3.122
	other	M	17.77	16.35	18.73
		N	26	26	26
		SD	3.581	3.358	3.894
Total		M	18.07	16.51	18.05
		N	319	319	319
		SD	3.058	2.752	3.238

3.6 The variance analysis results of factors such as gender, grade, urban and rural areas and employment intention in independent reading ability

Table 7   variance analysis results of independent reading ability score and its each dimension

Dimension / Sources of variation	Independent reading ability	Deep reading ability	Active reading ability
Grade	2.131	4.738**	5.279**
Gender	1.611	3.662	.436
Urban and rural	1.817	2.859	.361
Employment intention	.039	.074	.730
Grade ＊ Urban and rural	1.499	4.416*	.914
Grade ＊ Employment intention	2.452*	.942	1.139
Grade ＊ Gender	.479	2.743	2.417
Urban and rural ＊ Employment intention	.358	3.669*	.164
Urban and rural ＊ Gender	.545	1.205	.677
Employment intention ＊ Gender	.100	.307	.515

Seen from table 7, the factor of grade has significant impact on active reading ability and deep reading ability, rather than the existence of independent reading ability. Factors of gender, urban and rural areas and employment intention have no significantly affection on independent reading ability and all dimensions. Grade and urban and rural only have significant interaction effect on the "deep reading ability" score.

There is a significant interaction effect of grade and graduation intent on "independent reading ability" score, urban and rural and graduation intention only exists significant interaction effect in the "deep reading ability" score. Gender and grade, gender and urban and rural, and graduation intention and gender have not significantly interaction effect in reading comprehension metacognitive strategies and different dimensions.

3.7 Correlation analysis of learning engagement and reading comprehension metacognitive strategies

Firstly by analyzing the relationship of learning engagement and reading comprehension metacognitive strategies, the results are shown in Table 8.

Table 8   the correlation matrix of learning engagement and

reading comprehension metacognitive strategy of college students (r)

Dimension	GLOB	PROB	SUP
Motivation	.431**	.361**	.320**
Energy	.374**	.319**	.300**
Absorbed	.436**	.395**	.336**

As can be seen from table 8, college students learning engagement and reading comprehension metacognitive strategies are highly relevant each other. motivation, energy and focus were all significantly related to each dimension of reading comprehension metacognitive strategies.

3.8 Correlation analysis of learning engagement and independent reading ability

By analyzing the relationship of learning engagement and the independent reading ability, the results are shown in table 9.

Table 9   the correlation matrix of learning engagement and

the independent reading ability of college students (r)

Dimension	Independent reading ability	Deep reading ability	Active reading ability
Motivation	.196[**]	.326[**]	.185[**]
Energy	.190[**]	.339[**]	.178[**]
Absorbability	.283[**]	.353[**]	.263[**]

As can be seen from table 9, college students learning engagement and the independent reading ability are highly correlated, the various dimensions of motivation, energy and focus and independent reading ability were significant correlation.

4. Discussions

4.1 The overall situation of college Students' learning engagement, reading comprehension metacognitive strategy and independent reading ability

Overall, college students have been in a medium condition for learning engagement, reading comprehension metacognitive strategy and independent reading ability. The grade factor has significant impact on the "motivation", but has no significant effect on the "energy, focus on". College students in the second grade have been in a minimum level for "motivation" of learning engagement, those in a Junior and the third were higher than Sophomore. College Students' learning motivation presents the first rise then fall "U" trend. That may because that freshman just enter school, and learning enthusiasm is relatively high. With the adaptation of university life, college students gradually produce the learning burnout or lack of professional interest, resulting in decreased learning motivation. And the third grade students in University improve their learning motivation because they are going to graduate, and facing with the pressures of work, and learning objectives more clearly. In addition, the gender factor has significant effects on "motivation, energy, and focus on". Females were higher than males in the "motivation, energy, and focus on". However, the urban-rural factor doesn't has significantly influence on "motivation, energy, and focus on". Employment intention factor has significant impact on the "energy", may be due to the employment intention of making individuals define their goals, and paying the energy and efforts, and the ability to unremittingly in the face of difficulties. While in the "motivation, focus on" don't exist significantly influence, suggests that employment intention does not stimulate individual's intrinsic motivation, and put it into. Factors of gender, grade, urban and rural areas and employment intention have no significant affection on the reading comprehension metacognitive strategy and its each dimension. Reading comprehension metacognitive strategy

will not change because of different of gender, grade, urban and rural areas and employment intention, that is to say, grade, gender, urban and rural areas and employment intention have no significantly influence on individual reading process of setting goals, problem solving and modification strategy and supporting mechanism adopted for sustained response to reading. The factor of grade has significant impact on the depth of reading ability and active reading ability, from one to three, gradually improving students' understanding of the contents of the document and digestion ability and the ability of using knowledge and reading habits and reading methods. While factors such as urban and rural, gender, and employment intention don't have significant impact on independent reading capacity.

4.2 Analysis of the relationship between College Students' learning engagement, reading comprehension metacognitive strategy and independent reading ability

College students' motivation, energy and focus on are all significantly related to reading comprehension metacognitive strategies and each dimension. College students' learning engagement and autonomous reading ability are highly correlated with each other. University Students' interest in learning, understanding of learning meaning, and efforts to learn, learning objectives and learning degree involved in setting are related with problem solving and modify strategy.

5. Conclusions

(1) Overall, students have been in a good state of learning engagement, and at a medium level of reading comprehension metacognitive strategy, independent reading ability in general.

(2) College students in the second grade have been in a minimum level for learning engagement, those in a Junior and the third were higher than Sophomore. Women are higher than the male for learning engagement level. Graduate students are higher than other employment intention of College students for learning engagement level.

(3) The factor of grade has significant impact on the deep reading ability and active reading ability, independent reading ability for the high grade students is higher than those low grade students.

(4) Grade and graduation intent have significant interaction effects on "motivation" and "self reading ability". The factors such as grade and the urban and rural have significant interaction effect in the "energy", "problem solving strategy" and "deep reading ability". Urban and rural and graduation intention only exists significant interaction effect in the "deep reading ability" score.

(5) Learning engagement and reading comprehension and metacognitive strategies and self reading ability of college students are high mutually correlation .

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