Analysis of the Development Prospect of PubMed Products on Mobile Terminal

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Abstract

With the rapid development of mobile products and the increasing number of postgraduate candidates, it is an inevitable trend to study the development prospect of mobile application products. This article analyzes the factors that influence the development of mobile research product from two aspects: user (exogenous variable) and product's own characteristic (endogenous variable). According to the exogenous variables, we select several indicators from the quantitative index, classify the index types by cluster analysis, then use the SEM model to examine the relationship between the observed variables and potential factors, and using OLS and double logarithm model to regression analysis of the above indicators to test the significance of coefficients. According to the endogenous variables, the specific samples screened are classified and analized statistically. It includes the convenience, flexibility and repeatability are the main factors affecting their own development.

Keywords

Mobile products; SEM model; multivariate linear regression; cluster analysis.

1. Data Pretreatment

According to the latest PubMed data show that in 2017 the number of postgraduate entrance examination increased by 13.56%, a new round of postgraduate boom prompted a variety of postgraduate counseling product generation and development. However, at the same time, the high abandonment rate indicates that the traditional forms of counseling are not widely accepted during the postgraduate study[1.2.3]. With the rapid development of the Internet and mobile products, new forms of counseling continue to emerge[4.5.6]. The methods of postgraduate examinations are gradually shifting from the offline to the online mobile terminals. Mobile apps such as mobile apps are emerging in an endless stream, The next model, whether this new online product can gain a stable market share in an expanding market deserves further study[7.8]. For the basic personal information of candidates, candidates intention to study, preparation methods, sources of information such as the four major survey, the original data of a total of 10000 samples, excluding each option can not be classified samples, no clear meaning of the sample, empty samples and can not accurately identify the sample, a total of 9763 remaining samples, the remaining samples as the research object for data processing and analysis. Considering that the original data is a questionnaire format, in order to facilitate the analysis and description of the nature of the problem, the data needs to be quantified according to certain criteria. This paper refers to many ideas and methods commonly used in the literature[9.10.11], some of the data in the questionnaire has been streamlined and quantified, the treatment ideas and methods in the following table:

Table 1

Topic	Type	Name	Variable Meaning	Remarks
1	Category variables	gender	gender	0:Girls, 1 Boys
2	Category variables	age	Age grouping	
3	Numerical variable	city	Economic strength	The bigger the number, the stronger the strength
4	Category variables	experience	Is there any postgraduate experience?	0:No, 1:Yes
5	Numerical variable	motivation	PubMed wish strength	The bigger the number, the stronger
6	Numerical variable	candidates type	PubMed degree of difficulty	The bigger the number, the harder it is
7	Category variables	Information channel	Access to information	0:Offline, 1:on-line
9	Category variables	whether through the mobile terminal	Get information method	0:No, 1:Yes
11	Category variables	whether sign up off work	Whether to report off work	0:No, 1:Yes
15	Numerical variable	Day review time	review time	Take the median
16	Category variables	is offline	Is offline	0:No, 1:Yes
17	Numerical variable	Pc learning time	Pc-side learning time	Take the median
18	Category variables	Pc learning type	Whether exist conflict with the line	0:No, 1:Yes
19	Numerical variable	Mobile learning time	Mobile learning time	Take the median
20	Category variables	Mobile learning type	Whether conflict with the line	0:No, 1:Yes
21	Category variables	Agree	Identification of the trend of development	0:No, 1:Yes

2. Model Establishment

In this case, the product of the mobile terminal is mainly for the specific subject of the research department. Therefore, a comprehensive feature owned by this subject is a factor that needs to be considered in the development of the mobile terminal. Through the quantitative analysis of the questionnaire, we choose the candidates (q1), the city (q3), whether there is a comprehensive index of the q4 (q4) as a measure of the type of candidates, select the type of test (q5), total learning Duration (q7), and the reasons for admission (q11) form a comprehensive index to measure the individual's efforts.

Taking into account the development of alternatives (or complementary products) may also affect the mobile terminal development of the main factors, select the use of pc-side indicators (q12) to examine whether the use of pc-side mobile terminal is complementary or complementary role. The main

measure of the development of mobile terminals, select the test channel (q6), the mobile market (q9), whether to agree with the mobile terminal growth trend (q10) and mobile terminal usage (q13) to describe.

For the above several major aspects, through the method of structural equation, to build a comprehensive measurement of personal characteristics, effort, mobile terminal development. And then using linear regression method to examine the mobile terminal development and personal characteristics, effort and whether there is a significant correlation between alternatives, if the result is significant, then these indicators have a significant impact on the mobile terminal development, and vice versa Obvious impact, so as to find the main factors affecting mobile development.

Due to the structural equation, SEM, the advantages of traditional path analysis and factor analysis are combined, and the maximum likelihood estimation model is used to analyze the estimated value of the path coefficient of the structural equation to correct the model based on the result of data analysis. Therefore, the use of structural equation to study the correlation between factors, the establishment of matrix equation structural equation model is:

$$\begin{aligned} y &= \Lambda_y \eta + \varepsilon \\ x &= \Lambda_x \xi + \delta \\ \eta &= B\eta + \Gamma\xi + \zeta \end{aligned} \tag{1}$$

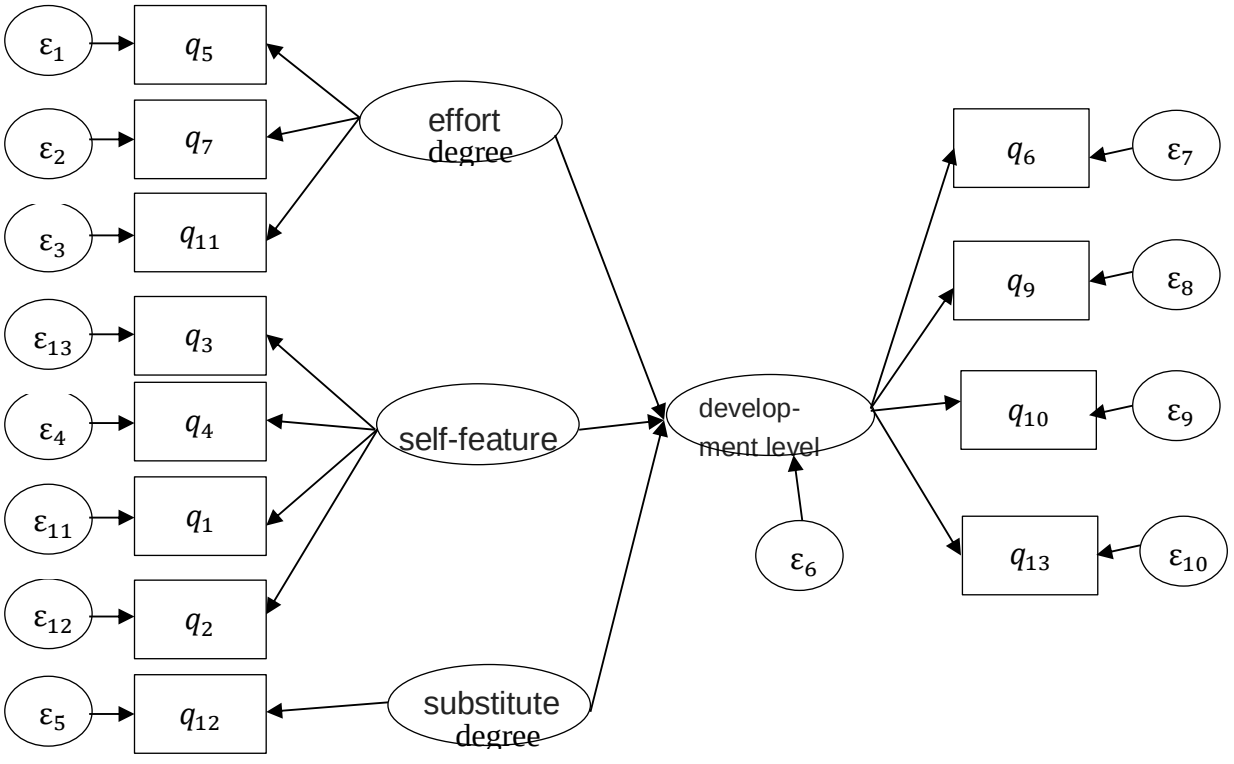

Figure 1

Use grtz to describe a comprehensive index that describes the personal characteristics of the group, nlcd to express the comprehensive index of the individual's effort, and fzcd to represent the comprehensive index of the mobile terminal's development degree. According to the construction equation of the structural equation, we have the following relations:

$$\text{grtz} = \alpha_1 * q_1 + \alpha_2 * q_2 + \alpha_3 * q_4 \tag{2}$$

$$\text{nlcd} = \beta_1 * q_5 + \beta_2 * q_7 + \beta_3 * q_{11} \tag{3}$$

$$\text{fzcd} = \gamma_1 * q_6 + \gamma_2 * q_9 + \gamma_3 * q_{10} + \gamma_4 * q_{13} \tag{4}$$

The chart of the reaction is as follows:

3. Model Solution

3.1 Descriptive Statistics

After the problem is quantified, the structural equations are used to compare the interdependencies between them. The average age of PubMed candidates at the age of 22, the number of its PubMed 1 to 2 times, on the average choice of the preparation channels online channels, the total length of PubMed spent a total of about 7 hours, the average length spent on the pc side of 1.26 Hours, the average time spent on the mobile terminal is 1.3 hours, pc-side and mobile-side duration is almost the same. PubMed students on the average mobile terminal with the trend of growth agree. The descriptive statistics of the relevant indicators are shown in the following table.

Table 2 Descriptive statistics

	N	Minima	Maximum	Mean	Standard deviation
generation	9762	19	25.5	21.8055	1.28179
PubMed times	9762	1	4	1.1219	0.37749
Preparation channels	9762	0	1	0.85	0.35706
Total time	9762	4.5	13.5	6.9539	2.54007
PC time	9762	0.5	4.5	1.2643	0.91155
Mobile terminal length	9762	0.5	4.5	1.3082	0.90038
Whether it agrees with the mobile terminal growth trend	9762	0	1	0.8384	0.36815
The number of valid samples	9762				

3.2 Relevant Models to Solve

Equation (2) is solved, the result is as follows:

Table 3 personal characteristic structure test results

grtz	Coefficient value	z test quantity	P value	[95%Conf.Interval]		Std. Err.
q1	0.3517835	72.76	0.000	0.3423078	0.3612592	0.0048346
q3	-0.8064253	-2.48	0.000	-1.444628	-0.168222	0.3256197
q4	1.214071	1.36	0.000	-0.134594	2.967908	0.8948311

It can be seen that q4 is not significant among the comprehensive indicators of personal characteristics constructed, while the other two variables are significant to the comprehensive index of the structure, so q4 is eliminated. The revised model is :

$$\text{grtz} = \alpha_1 * q_1 + \alpha_2 * q_2 \quad (2.1)$$

Equation (3) is solved, the result is as follows:

Table 4 Efforts Structural equation test results

nlcd	Coefficient value	z test quantity	P value	[95%Conf.Interval]		Std. Err.
q5	2.173227	382.33	0.000	2.162086	2.184368	0.0056842
q7	5.25263	2.59	0.010	1.278903	9.226357	2.027449
q11	-6.236501	-0.54	0.587	-28.71849	16.24549	11.47061

From the above results, we can see that q11 has no significant effect on this indicator in the constructed comprehensive indicator of personal effort, and should be excluded from the indicator. The revised model is:

$$\text{nlcd} = \beta_1 * q_5 + \beta_2 * q_7 \tag{3.1}$$

Equation (4) is solved, the result is as follows:

Table 5 degree of structural equation test results

fzcd	Coefficient value	z test quantity	P value	[95%Conf.Interval]		Std. Err.
q6	0.850246	235.35	0.000	0.8431653	0.8573267	0.0036126
q9	40.24699	5.22	0.000	25.14951	55.34448	7.70294
q10	3.02392	5.01	0.000	1.840915	4.206924	0.6035849
q13	7.188771	5.33	0.000	4.542847	9.834696	1.349986

It can be seen that the selected indicators describing the development of mobile products are significant. Therefore, the final three models are:

$$\text{grtz} = q_1 - 0.81 * q_2$$

$$\text{nlcd} = q_5 + 5.25 * q_7$$

$$\text{fzcd} = q_6 + 40.24 * q_9 + 3.02 * q_{10} + 7.19 * q_{13}$$

According to the above formula, three new variables are constructed, which are pz representing personal characteristics, nlc for personal effort, and f representing degree of development.

For factors that may affect f, the least square method is used to construct the regression model to investigate the correlation between variables. The specific model is as follows:

$$\text{f} = \alpha_0 + \alpha_1 * \text{pc} + \alpha_2 * \text{nlc} + \alpha_3 * \text{q}_{12} + \alpha_4 * \text{q}_4 + \alpha_5 * q_5 \tag{5}$$

Regression of the above model using least square method, the result is as follows:

From the above results, it can be seen that the personal characteristics of the research group does not have a significant impact on the development of the mobile terminal. However, the degree of individual effort and the use of the pc terminal can significantly promote the development of the mobile terminal. End product development has a negative significant effect. When the two variables, pz and q5, are removed, they have no significant effect on the result, so the result can be considered as credible. The higher the degree of personal effort, the higher the degree of resource demand is, the

greater the utilization of resources. As a relatively easy and convenient mobile channel for consulting and learning resources, the mobile terminal can largely meet the demand The demand of the group, therefore, proves that the level of individual effort is a significant factor both in theoretical expectation and empirical analysis, and its coefficient is also significant. For the Kaoyan reasons, the coefficient is not significant in the regression, indicating that the development of products, the focus is not why people choose Kaoyan, but whether people choose Kaoyan. When people choose PubMed, they will use various channels to find information, information, consulting, etc., and the mobile terminal will be developed accordingly. PubMed number of times the development of the product has a negative effect, because most online resources have reproducible characteristics, for the second or even more groups, when the first choice of mobile or pc end After the product, its resources can be reused, so in the later stage will be a corresponding reduction in the demand for mobile products, which showed a negative correlation, which is consistent with our expectations.

Table 6 Analysis of the main factors regression model test results

nlcd	Coefficient value	z test quantity	P value	[95%Conf.Interval]		Std. Err.
pz	-0.4865596	-1.00	0.316	-1.436912	0.4637925	0.4848222
nlc	0.5940068	21.54	0.000	0.5399493	0.6480644	0.0275775
q12	103.6591	43.12	0.000	98.94633	108.372	2.404243
q4	-2.295307	-2.01	0.044	-4.53203	-0.0585793	1.141067
cons	13.6254	9.37	0.000	10.77532	16.47548	1.45397

Specific ideas and operations, respectively, the explanatory variables f, explain the variable personal characteristics pz, effort nlc, pc use q12, take logarithm coupled with the number of Kaoyan q4 and Kaoyan reasons q5 two variables, and then do regression analysis, The result is as follows:

Table 7 Analysis of the main factors Logistic regression model test results

lnf	Coefficient value	z test quantity	P value	[95%Conf.Interval]		Std. Err.
q4	-0.0395042	-2.06	0.039	-0.077018	-0.0019902	0.0191378
ln_n	0.480933	25.47	0.000	0.4439198	0.4287745	0.0188823
ln_q12	0.4124034	49.38	0.000	0.3960324	0.4287745	0.0083517
pz	-0.0084873	-1.04	0.297	-0.024436	0.0074618	0.0081365
_cons	2.89127	44.56	0.000	2.764091	3.018448	0.0648802

As can be seen from the above regression results, the reasons and personal characteristics of the entrance examination are still not significant, consistent with the previous results. The efforts, the development of pc-side and the number of semesters are still highly significant, and the resilience is 0.477,0.419 and -0.04, respectively, indicating that the degree of effort, pc-side and the number of exams are the main factors affecting mobile development.

3.3 Qualitative Analysis of The Error Term

In the process of establishing the model analysis above, the selected variables can all be considered as exogenous variables and the influence of external factors on the mobile terminal development. However, it is worth noting that not only the users have an important influence on the development

of mobile products, but also some of the advantages of the products themselves are also an important factor affecting their development, which is reflected in the model Among the error terms, the following qualitative analysis of some of the factors affecting the product itself.

Respectively, in the choice of online channels and online mobile data samples for classification statistics, come to the development of the mobile terminal itself exist. Specific results are as follows:

Table 8

	10 questions	12 questions	22 questions	23 questions
A	1604	1637	1695	935
B	1577	740	1581	225
C	607	1238	478	212
D		37	4	702
E				16

Among the people who choose online channels and online mobile terminals, they think that online mobile terminals are 42% and 24% respectively, both quick and comprehensive and timely, indicating that the main advantages of online mobile terminals are convenience Fast and universal timely.

In the sample, the flexibility to schedule time online versus online offline options accounted for 79% for repeatable learning, compared with 21% for round-trips and others. Thus, for the product itself, repeatability and time flexibility are also factors that promote their own development.

Among the comparison of pc end and mobile end, the two aspects that there are obvious advantages of mobile end are two factors of time fragmentation and anytime and anywhere, accounting for 87%. That is, convenience is also an important factor that affects the development of mobile end.

And in everyone's expectations for the mobile terminal this option, most of the improvements can be concentrated in both exchange and integration, accounting for 78%. This shows that functional integration is also an important factor affecting the development of the mobile terminal in the future.

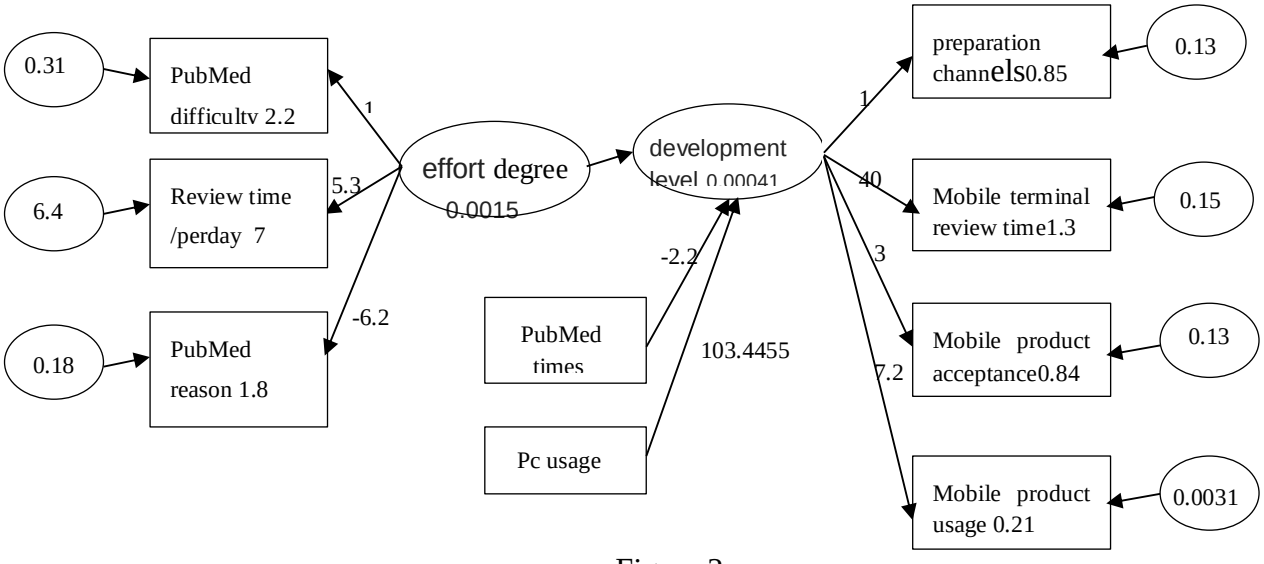

Figure 2

4. Summary

Through the above empirical analysis and qualitative analysis of two aspects, to identify the mobile terminal can significantly affect the development of the main factors, including both the product itself, some of the factors, but also some external factors. Its own factors include its own characteristics, convenience, at any time, communication and repeatability of the four major factors, and external, including personal efforts, that is, the type of candidate, review the length of time, coupled with the

development of pc-side and PubMed Frequency, etc., can have a significant impact on the development of the mobile terminal.

References

[1] Jin Xinquan, Zhang Linying, Zhu Liancao, etc .. The status quo of college students using mobile phones research --- educational app design and development of enlightenment [J] Chinese Medical Education Technology, 2016,31 (6): 625-631.
[2] Luo Dong, Liu Si, Shen Lingpei, etc. University students on the satisfaction of education mobile app survey [J] Modern Commerce and Industry, 2016.87-88.
[3] Hu Yue, Wang Yining, Xu Peng et al. Development of Education in the Internet Era - Interpretation and Inspiration of the Handbook of Educational Technology Developers in the United States [J]. China Electrochemical Education, 2016.41-48.
[4] Wang Ting, Wang Nan. Based on the content analysis method of education APP [J]. China Education Information, 2016.83-87.
[5] Yao Tingting. Educational tools APP operational strategy analysis [J]. Wireless Internet Technology, 2016.80-82.
[6] Mei Jingsong, Peng Kun 2014 China Education APP evaluation report [R]. Sina education, 2014: 1-256.
[7] Song Xiaoling. Research and Design of Learning Application APP for Mobile Terminal Equipment [D]. Kaifeng: Henan Normal University, 2014: 23-46.
[8] Li Ling, Hu Weixing, Jiang Meimei, et al.Application model of educational mobile APP [J] .China Information Technology Education, 2015 (12): 82-84.
[9] http:// www. cnnic. net.cn /hlwfzyj /hlwxzbg /hlwtjbg/201701/t20170122_66437.htm
[10] http://36kr.com/p/5055348.html
[11] http://www.askci.com/news/hlw/20170105/15115586447.shtml