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Analysis of the relationship between academic achievements and employment status of graduates majoring in information and computing science of China

Qi Han[1], Yiliang Zhao[2], Xintong Yang[3], Zezhong Yang[4*]
[1, 2, 4] School of Mathematics and Statistics, Shandong Normal University, Jinan, Shandong, China
[3] School of Mathematics and Statistics, Northeastern University at Qinhuangdao, Qinhuangdao, Hebei, China

Abstract
With the method of survival analysis, the relationship between the curriculum scores and employment status of 77 students of the Information and Computing Science major in a normal university was studied. The results showed that except for the scores of sports, the other scores of courses had little effect on employment. The level of professional compulsory courses and professional optional courses had a significant impact on employment. Therefore, in order to promote students to get a job as soon as possible, it is suggested to reform the curricula of Information and Computing Science comprehensively, enhance the teaching of professional compulsory courses and professional optional courses in particular.

Keywords: information and computing science, normal universities, employment, survival analysis

1. Introduction
Information and Computing Science is a newly added mathematics major adjusted by the Ministry of Education of the People's Republic of China in 1998. It aims to cultivate high-level professionals with solid mathematical foundation and good mathematical literacy who can solve some practical problems with the knowledge and computer skills they have learned (Xuan & Li, 2016) [9]. At present, nearly 500 universities across the country have created this major. The scale of professional enrollment is so large and the development speed is so fast, it is an opportunity for the development of mathematics, but it also faces many problems, such as graduates' employment. At present, although graduates of this major have good professional skills, employment in the current social system has been challenged as never before (Song, 2013; Bai, 2003; Ma & Zhan, 2014) [7, 1]. Therefore, assisting the normal universities' graduates with successful employment has become a top priority.

2. Literature review
Different from the curriculum and time schedule of Information and Computing Science major in the comprehensive universities, the Information and Computing Science major of normal universities are based on the original professional characteristics (Zeng, 2014) [11]. In order to promote the students to get a job, many researchers have started from the university curriculum reform and made many studies. For example, Zhao Yue suggested that it is necessary to improve the setting and arrangement of teacher's education courses in normal universities, and help non-teacher students who want to engage in the teacher education industry in the future to make a good knowledge reserve. Zhao Tianming believed that not only professional courses have an effect on student employment, but other public courses, such as Innovative Entrepreneurship courses, Ideological and Political courses, Sports, and Employment Guidance courses, are also beneficial to the personal development of students. Wang Jie proposed that the professional characteristics of the major of Information and Computing Science determine that the profession can cultivate applied talents for the society. It is necessary to strengthen the education of applied talents through practical curriculum reform, establish a teaching and testing base in the school, and constantly apply the practice to students' learning (Zhao, 2017; Zhao, 2018; Liu & Lu, 2018; Liu & Sun & Dai & Liu, 2018; Yu & Lai, 2019; Wang, 2018) [12, 13, 3, 4, 10, 8].
It is undeniable that the above researches provide a good idea. However, it is obviously not comprehensive. For example, there is no research on the relationship between students' curricula grades and their employment status in the current study. Actually, this kind of research is important for that it not only lets teachers and researchers clearly understand the influence factors of the employment but also helps the normal universities to arrange the curricula and class schedules according to the priority so as to correctly guide the students to get a job.

3. Method
3.1 Sample
A total of 92 graduates in Information and Computing Science at a School of Mathematics and Statistics of a normal university in China were selected as the initial samples. After that, the students who went to study postgraduate degree and went abroad were removed, and the remaining 77 students were sampled.

3.2 Method
Firstly, the aforementioned academic performance and the Morality education scores are integrated into six kinds of grades of professional compulsory courses, professional optional courses, other compulsory courses, English, Sports

and Morality education performance. Secondly, we analyzed the relationship between these six categories of results and their employment situation in July by the method of survival analysis.

3.3 Data Analysis
With the help of SPSS software, the survival analysis of the above six variables were carried out (Li & Ding, 2008).

4. Results
4.1 The Impact of Academic Achievement on Employment
Using the Cox function to analyze the six variables and the employment situation, the result is as shown in table 1.

Table 1: Regression of six variables

Variable in the equation						
	B	**SE**	**Wald**	**df**	**Sig.**	**Exp(B)**
professional compulsory courses	-.013	.079	.028	1	.868	.987
professional optional courses	.132	.092	2.046	1	.153	1.141
other compulsory courses	.057	.120	.226	1	.635	1.059
Sports	-.106	.046	5.206	1	.023	.900
Morality education performance	.028	.089	.103	1	.748	1.029
English	-.030	.049	.375	1	.540	.970

It can be seen from the table 1 that the absolute value of the coefficient B of all variables was less than 1, which indicated that the above six variables had little effect on the employment status. Only the companion probability of Sports was less than 0.05, which indicated that the impact of Sports on employment was significant, unfortunately the impact was negative.

4.2 The Impact of differences in grades on employment
Each of the above six kinds of grades was divided into four levels of the excellent, good, medium and poor, which were represented by 1, 2, 3, and 4 respectively. Then we analyzed the impact of different levels on employment.

4.2.1 The impact of different levels of professional compulsory courses on employment
Using the K-M method to calculate the effect of the professional compulsory courses on the employment situation, and the results obtained are as shown in table 2.

Table 2: Log rank test for grade 1 (professional compulsory courses)

Overall comparison			
	chi-square	**df**	**Sig.**
Log Rank (Mantel-Cox)	10.435	3	.015

It can be seen from table 2 that the companion probability was 0.015, which was less than 0.05. This indicated that the different grades of professional compulsory courses were significant on employment status.

4.2.2 The Impact of different levels of professional optional courses on employment
Using the K-M method to calculate the effect of the professional optional courses on the employment situation, and the results obtained are as shown in table 3.

Table 3: Log rank test for grade 2 (professional optional courses)

Overall comparison			
	chi-square	**df**	**Sig.**
Log Rank (Mantel-Cox)	7.915	3	.048

It can be seen from table 3 that the companion probability was 0.048, which was less than 0.05. This indicated that the different grades of professional optional courses were significant on employment status.

4.2.3 The impact of different levels of other compulsory courses on employment
Using the K-M method to calculate the effect of the other compulsory courses on the employment situation, and the results obtained are as shown in table 4.

Table 4: Log rank test for grade 3 (other compulsory courses)

Overall comparison			
	chi-square	**df**	**Sig.**
Log Rank (Mantel-Cox)	1.278	2	.528

It can be seen from table 4 that the companion probability is 0.528, which was greater than 0.05, which indicated that the different grades of other compulsory courses were insignificant on employment status.

4.2.4 The impact of different levels of English on employment
Using the K-M method to calculate the effect of English scores on employment status, and the results obtained are as shown in table 5.

Table 5: Log rank test for grade 4 (English)

Overall comparison			
	chi-square	**df**	**Sig.**
Log Rank (Mantel-Cox)	1.958	3	.581

It can be seen from table 5 that the companion probability is 0.581, which was greater than 0.05, which indicated that the different grades of English was insignificant on employment Status.

4.2.5 The impact of different levels of sports on employment
Using the K-M method to calculate the effect of sports scores on employment status, and the results obtained are as shown in table 6.

Table 6: Log rank test for grade 5 (sports)

Overall comparison			
	chi-square	**df**	**Sig.**
Log Rank (Mantel-Cox)	1.576	3	.665

It can be seen from table 6 that the companion probability is 0.665, which was greater than 0.05, which indicated that the

different grades of sports was insignificant on employment status.

4.2.6 The impact of different levels of morality education performance on employment

Using the K-M method to calculate the effect of morality education performance scores on employment status, and the results obtained are as shown in table 7.

Table 7: Log rank test of grade 6 (Morality Education Performance)

Overall comparison			
	chi-square	**df**	**Sig.**
Log Rank (Mantel-Cox)	4.333	3	.228

It can be seen from table 7 that the companion probability is 0.228, which was greater than 0.05, which indicated that the different grades of morality education performance was insignificant on employment status.

5. Discussion

From the results of the above Cox regression calculation, it can be seen that the above courses grades have little effect on the employment status in July, but there is a significant regression relationship between the sports curriculum and employment. This means that the sports courses' grades have a greater impact on the employment in July. However, its impact was negative.

From the results calculated by the above K-M method, it can be seen that among the above six courses. The companion probability of grade 1 (professional compulsory courses) is 0.015, less than 0.05, indicating that the better the grade of professional compulsory courses, the greater the impact on employment in July, the worse the grade, the smaller the impact on employment in July. The companion probability of grade 2 (professional optional courses) is 0.048, less than 0.05, indicating that the better the grade of professional optional courses, the greater the impact on employment in July, the worse the grade, the smaller the impact on employment in July.

6. Conclusion

From the above analysis, it is known that except for the scores of sports, the grades of other courses have little effect on the employment situation. It is recommended that the university curricula reform and the class hour arrangement should be arranged in a targeted manner to enhance these courses' impact on employment. Among them, the grades of professional compulsory courses and professional optional courses achievements have a significant impact on employment. Therefore, it is necessary to improve the students' professional compulsory courses, professional optional courses, improve the teaching methods of professional courses, help students to better receive professional knowledge, and acquire professional skills to better adapt to employment.

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