

Identifying Poor and Low Academic Performance: Continued

学業不良と低レベル学業達成度についての検討

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Keywords : GPA, performance based academic guidance, early identification (早期発見)

Introduction

This research reports and discusses the results for three case studies. The first study examines the first semester data for the 396 freshmen who matriculated at Edogawa University in 2013 in the following three areas: ①attempted credits (履修登録単位数), ②earned credits (取得単位数), and ③GPA. ⁱ This data is compared with the data previously reported for the 2012 freshmen class (Kelly 2013). The second study examines the progress of the 2012 freshmen class at the end of the first semester of their sophomore year. The third study examines the progress of the 2011 freshman Class at the end of the first semester of their junior year.

This report is part of a larger co-operative research project that has been generously funded by Edogawa University for the 2013 academic year. ⁱⁱ After a descriptive presentation of the statistics, it will again be argued in the discussion that the system still being used at Edogawa University to identify students “needing guidance” (要注意) is flawed on several counts and that the performance based GPA system offers a better method for identifying poor and low academic status.

Case Study 1 Freshman Class of 2013

Method

GPA Calculations

As the number of attempted credits is not indicated on the students' report card (成績通知書)ⁱⁱⁱ, attempted credits for each student were calculated as the sum of credits in each grade (A優・B良・C可・D不可). The number of earned credits for each student was collected directly from individual report cards. After converting the data from pdf format to an Excel table, the number of credits earned for each grade was counted using Excel's COUNTIFS function. Each student's GPA was calculated by semester and cumulatively using the following formula:

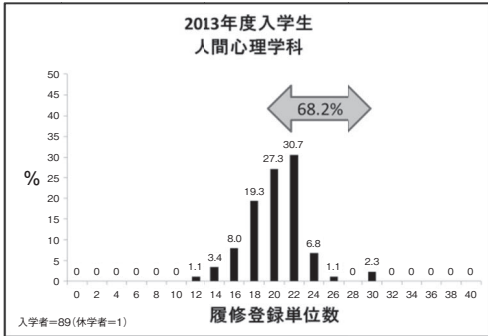
$$\text{GPA} = \frac{(A \times 3) + (B \times 2) + (C \times 1)}{A + B + C + D} \quad \text{iv}$$

2013年11月30日受付

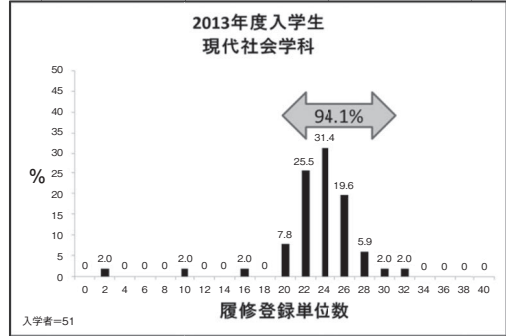
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It should be noted that Grade Point Average (GPA) is a weighted average (重加平均) and that any group's average is properly calculated in the same way as an individuals, that is, as the group's totals for each grade plugged into the above formula. While it is true that calculating a group's average as the average of individual averages will produce a result that may approximate the true average, this practice could needlessly introduce error into the analysis of the data because a group average is used in a number of descriptive statistical calculations, for example, variance, deviation, standard deviation, and correlation.

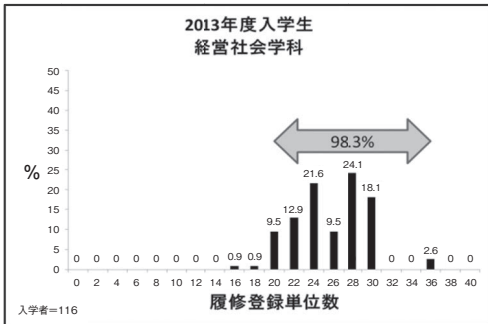
Results ① Attempted Credits



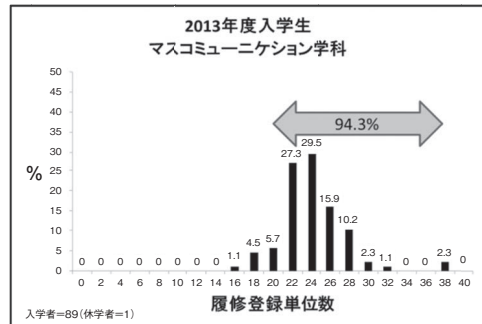
Graph 1-1.1 Dept. of Psychology & Humanities



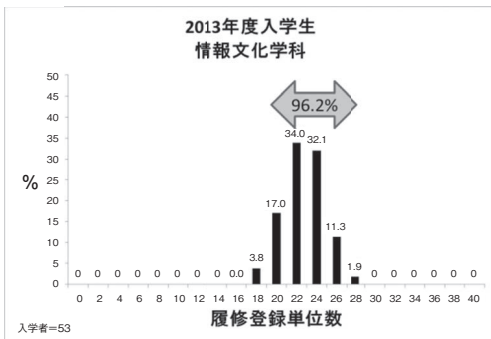
Graph 1-1.2 Dept. of Contemporary Society



Graph 1-1.3 Dept. of Business Management



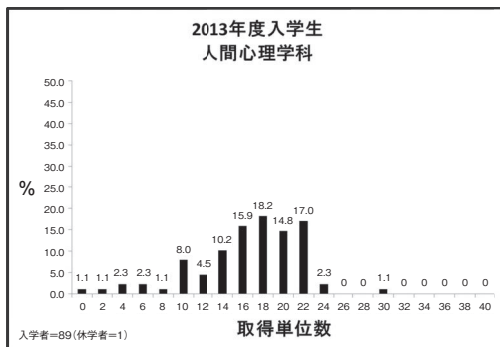
Graph 1-1.4 Dept. of Mass Communication



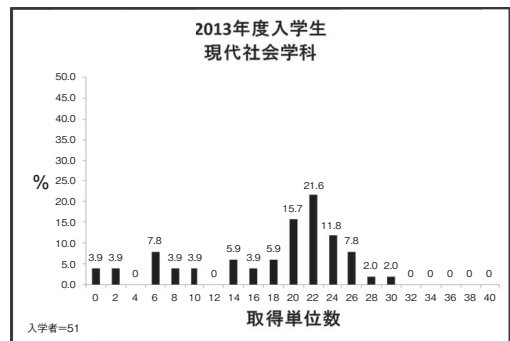
Graph 1-1.5 Dept. of Business & Communication

Graphs 1-1.1 through 1-1.5 are histograms of attempted credits by department. As shown in Graphs 1-1.2 through 1-1.5, the number of attempted credits in the departments of Contemporary Society, Business Management, Mass Communication, and Business & Communication are tightly grouped; 94.1, 98.3%, 94.3%, and 96.2% of the students in these four departments respectively registered for more than 20 credits. In contrast, Graph 1-1.1 shows that in the Department of Psychology and Humanities 68.2% (up from last year's 49.6%) registered for 20 or more credits, with 27.1% registered for 16 or 18 credits, while the remaining 4.5% registered for only 12 or 14 credits. As previously explained (Kelly, 2013) , relative to the other departments this lower number of credits attempted in the first term is primarily due to the existence of several year-long courses (通年科目) for which the credits are awarded only at the end of the second semester.

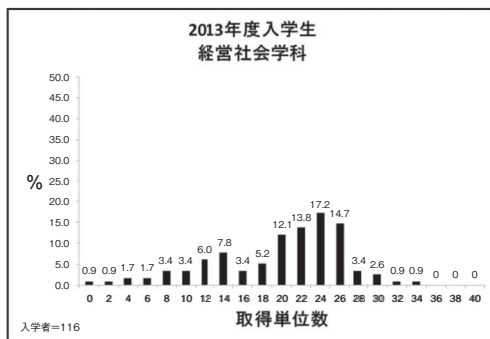
Results ②Earned Credits



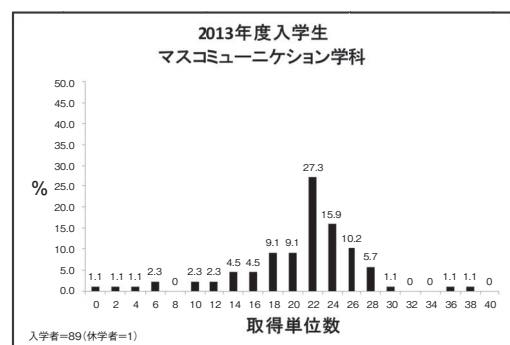
Graph 1-2.1 Dept. of Psychology & Humanities



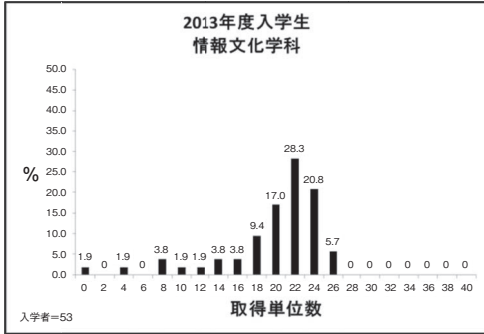
Graph 1-1.2 Dept. of Contemporary Society



Graph 1-2.3 Dept. of Business Management



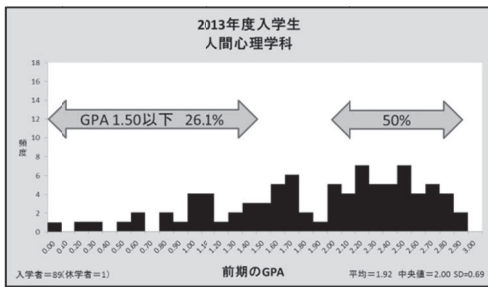
Graph 1-2.4 Dept. of Mass Communication



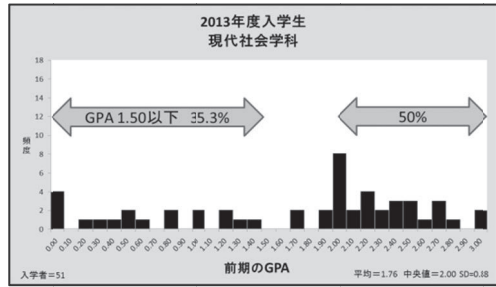
Graph 1-2.5 Dept. of Business & Communication

Histograms of earned credits by department are shown in Graph 1-2.1 through Graph 1-2.5.

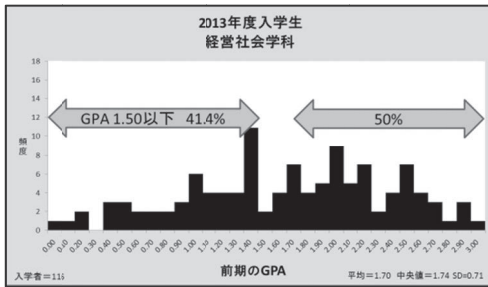
Results ③ GPA



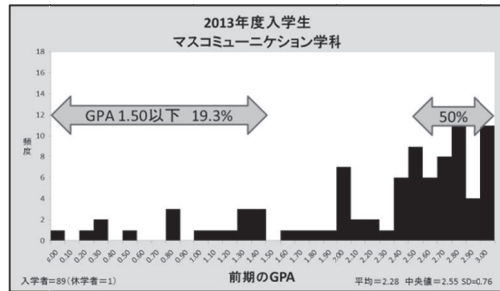
Graph 1-3.1 Dept. of Psychology & Humanities



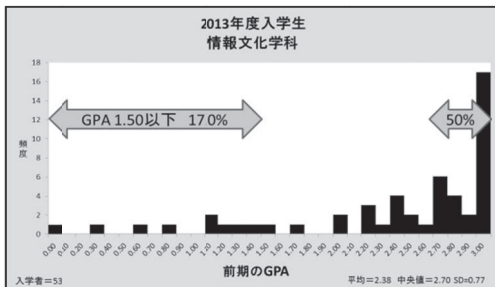
Graph 1-3.2 Dept. of Contemporary Society



Graph 1-3.3 Dept. of Business Management



Graph 1-3.4 Dept. of Mass Communication



Graph 1-3.5 Dept. of Business & Communication

GPA histograms by department are shown in Graphs 1-3.1 through 1-3.5. The median (中央値) GPA and standard deviation for each is also given. The GPA scores of the Dept. of Mass Communication are dramatically skewed left. It cannot be determined whether this skewing is a function of so-called easy grading criteria or whether it is inherent to a grading system in which the grade of A is awarded for 80-100, that is, twice the range of either B or C grades.

Fig.1 and Fig.2 below provide descriptive statistics for the 2013 and 2012 Freshman Classes respectively. The number of credits awarded for each grade and its percentage of the attempted credits is provided. Five t-tests ($\alpha = .05$) were carried out for each department's averages for both years. In each case the null hypothesis was not rejected, so despite the arithmetic differences between years, the department averages are not statistically significant.

2013年度入学生 1年前期終了 学科別学業パフォーマンス

学科・在籍状況	履修	取得	評価別(単位数・%)				GPA		
			優	良	可	不可	平均値	中央値	SD
人間心理 88人(+休学1名)	1776	1446	814 45.8%	336 18.9%	296 16.7%	330 18.6%	1.92	2.00	0.69
現代社会 51人	1184	900	484 40.9%	214 18.1%	204 17.2%	282 23.8%	1.76	2.00	0.88
経営社会 116人	2992	2298	1110 37.1%	572 19.1%	616 20.6%	694 23.2%	1.70	1.74	0.71
マスコミュニケーション 88人(+休学1名)	2124	1828	1380 65.0%	250 11.8%	198 9.3%	296 13.9%	2.28	2.55	0.76
情報文化 53人	1204	1044	830 68.9%	162 13.5%	52 4.3%	160 13.3%	2.38	2.70	0.77

Fig.1 2013 Freshman Class Academic Performance by department

2012年度入学生 1年前期終了 学科別学業パフォーマンス

学科・在籍状況	履修	取得	評価別(単位数・%)				GPA		
			優	良	可	不可	平均値	中央値	SD
人間心理 119人(+休学1名)	2276	1824	1052 46.2%	492 21.6%	280 12.3%	452 19.9%	1.94	2.10	0.76
現代社会 45人	1020	788	426 41.6%	200 19.5%	166 16.2%	232 22.7%	1.80	2.18	0.85
経営社会 145人(+休学1名)	3620	2860	1370 37.8%	862 23.8%	628 17.3%	760 21.0%	1.79	1.92	0.77
マスコミュニケーション 99人	2358	1932	1314 55.6%	370 15.7%	252 10.7%	426 18.0%	2.09	2.40	0.71
情報文化 63人	1502	1316	956 63.6%	228 15.2%	132 8.8%	186 12.4%	2.30	2.64	0.79

Fig.2 2012 Freshman Class Academic Performance by department

Fig.3 and Fig.4 show the number of student by department designated by the GPA-based academic performance criterion as having poor and low performance.

2013年度入学生 1年前期終了 学科別学業パフォーマンス問題者

学科・在籍状況	学業不良	低レベル学業		計
	0.00～ 1.00	1.01～ 1.50	>1.50*	
人間心理	11	12	2	25
88人(+休学1名)	12.5%	13.6%	2.3%	28.4%
現代社会	14	4	0	18
51人	27.5%	7.8%	-	35.3%
経営社会	22	26	1	49
116人	19.0%	22.4%	0.9%	42.2%
マスコミュニケーション	9	8	1	18
88人(+休学1名)	10.2%	9.1%	1.1%	20.5%
情報文化	4	5	1	10
53人	7.5%	9.4%	1.9%	18.9%

* 不可の単位数または取得単位数の条件を果たしたくない

Fig.3 Freshmen designated after the first semester in 2013 as having poor and low academic performance by dept.

2012年度入学生 1年前期終了 学科別学業パフォーマンス問題者

学科・在籍状況	学業不良	低レベル学業		計
	0.00～ 1.00	1.01～ 1.50	>1.50*	
人間心理	17	12	2	31
119人(+休学1名)	14.3%	10.1%	1.7%	26.1%
現代社会	11	5	0	16
45人	24.4%	11.1%	-	35.6%
経営社会	26	20	2	48
145人(+休学1名)	17.9%	13.8%	1.4%	33.1%
マスコミュニケーション	11	15	2	28
99人	11.1%	15.2%	2.0%	28.3%
情報文化	6	7	0	13
63人	9.5%	11.1%	-	20.6%

* 不可の単位数または取得単位数の条件を果たしたくない

Fig.4 Freshmen designated after the first semester in 2012 as having poor and low academic performance by dept.

Discussion

The attempted credits data of 2013 freshmen class (Fig.3) shows a high percentage of students in all departments registered for 20 or more credits during the first semester. Relative to the other departments the lower percentage seen among freshmen of the Dept. of Psychology and Humanity is of no consequence because of the two year-long required courses in the freshman curriculum for that department. The percentage of students in the Dept. of Business Management who have registered for 28 or more credits during the first semester is, relative to other departments, worthy of note because 1) it does not appear to be driven by the curriculum and because 2) it suggests, in light of the low department GPA, there might be a tendency to over-register for courses. In that the same department's 2012 freshman class exhibited a similar tendency (32.4%; Kelly 2013) further investigation is warranted.

This case study generated a GPA for each student based on the grades the received for the first semester of 2013, identifying 120 students by department (30.3% of the freshman class) as having poor

and low-level academic performance. The results of Case Study 3 of this report show that among the 2011 freshmen students identified with the same criteria as having poor academic performance, slightly over 50% have dropped out and another 20% did not meet the requirements to register for the junior year seminar. Likewise, nearly 25% of the 2011 freshmen students with low academic performance have dropped out (see Graph 3-1). If these results are tentatively applied to the 2013 freshmen class we can expect 42 of these 120 poor and low-level to dropout by the end of their sophomore year.

Case Study 2 Freshman Class of 2012

Introduction

The merits of the performance based system used vis-a-vis the system presently used by the university to identify students “in need of guidance” was previously discussed (Kelly, 2013) . This case study seeks to understand how to better evaluate the progress of sophomore students through the end of the first semester.

Method

GPA for the freshman class of 2012 was calculated for each semester and cumulatively using the formula described in Case Study 1 above. GPA and earned credits were selected, presented as scatterplots by department, and analyzed.

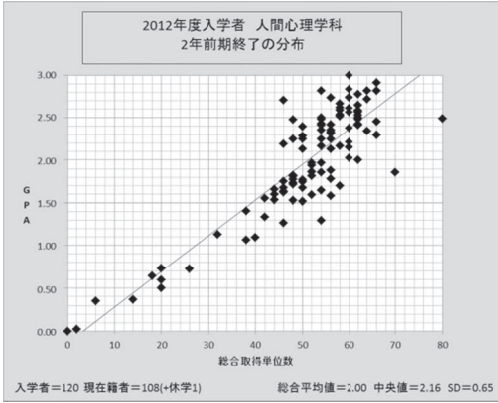
Results

Graph 2.1 through Graph 2.5 scatterplots by department of GPA and earned credits at the end of the first semester of the sophomore year are presented below.

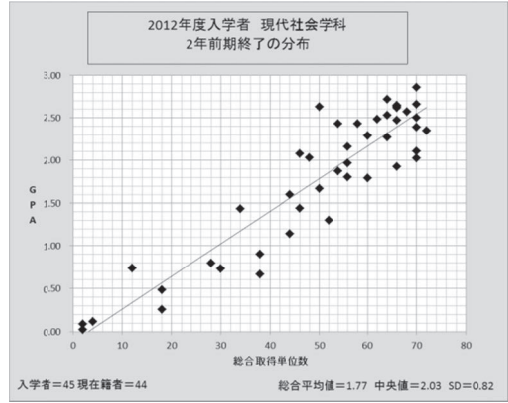
Discussion

In this case study of sophomore students it was again shown that earned credits as the sole criterion for identifying students with problems is too facile in that identifies only the students with the most serious problems while missing others completely. A student, for example, who has earned, say, 44 credits at whatever GPA during the freshman year would not be tagged as “in need of guidance” no matter how poorly he/she performed, including failing every course in the first semester of the sophomore year. This blind spot exists because simply having accumulated more than 40 earned credits satisfies the system's criterion. Let's examine an actual example.

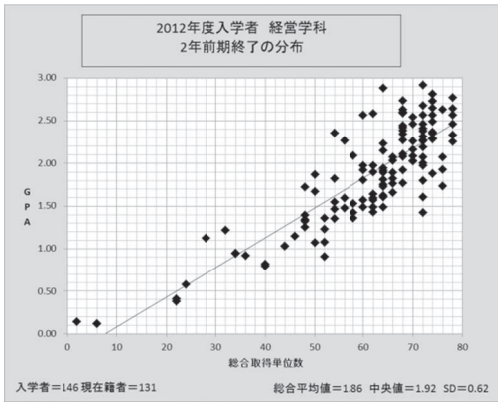
In Graph 2.5 a small cluster of 6 students can be seen in the lower quadrant left. As these 6 students all have 40 or less earned credits they would be identified as “in need of guidance” . The small cluster of 5 students in the GPA 1.00 to 1.50 range, however, would not have been recognized as “in need of guidance”, despite the fact they are well below the department average (2.12). Furthermore, there is a small cluster of 5 students somewhat above the GPA 1.50 margin who have between 50 and 62 earned credits. Technically, these students even in the GPA-based performance based system would cumulatively be considered in the acceptable performance range, however, because the system also considers the first semester of the sophomore year separately it was possible to observe that 4 of these 5 students had either poor or low academic performance that semester. It can be seen, then, a system that



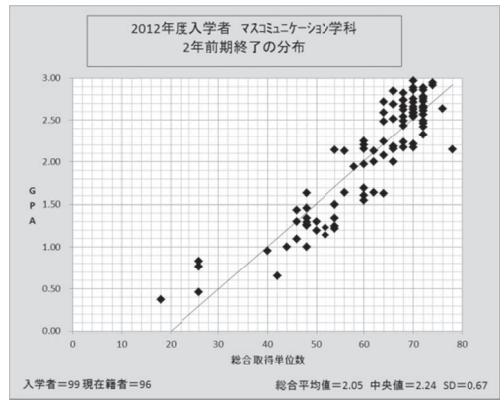
Graph 2.1 Dept. of Psychology & Humanities



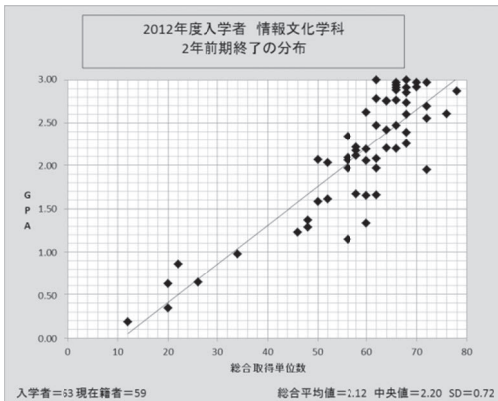
Graph 2.2 Dept. of Contemporary Society



Graph 2.3 Dept. of Business Management



Graph 2.4 Dept. of Mass Communication



Graph 2.5 Dept. of Business & Communication

focuses on cumulative earned credits does not have sufficient power to identify some students who may truly benefit from some guidance. Moreover, the fifth student in this small group had previously been in

the low academic performance category after the first semester of the freshman year. However, as a result of a somewhat better second semester and a personal best GPA in the sophomore year first semester his/her cumulative GPA rose above the 1.50 cutoff. This student wasn't even marked by the earned credit system, despite somewhat low-level performance. After a shaky start and two better semesters this type of student should be given positive feedback and encouragement to continue his/her progress. The example discussed here is not limited to the Dept. of Business & Communication, but no attempt will be made here at cataloguing all such examples. What is worth noting here is that displaying the GPA and earned credit data in a scatterplot made it a rather simple task of seeing the whole picture in context of the department.

Case Study 3 Freshman Class of 2011

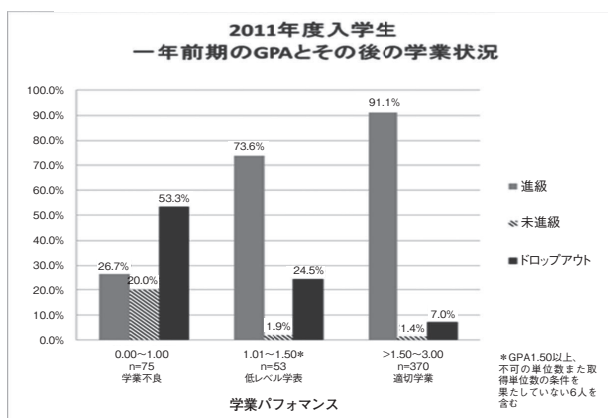
Introduction

This case study seeks to determine what, if any, relationship exists between freshman year first semester academic performance and the mid-point progress toward graduating in 4 years. The two pan-department criteria in effect for students matriculating in 2011 for registering for the required third year seminar course are: 4 semesters of enrollment and 62 graduation applicable earned credits.

Method

GPA for the freshman class of 2011 was calculated for each semester and cumulatively using the formula described in Case Study 1 above. A chi-square test was performed on the GPA performance data for the 2011 freshman class' first semester and their present (2013.11.13) enrollment status. To the poor and low-level academic categories and third category – acceptable academic performance – has been added to designate the students whose grade point average was greater than 1.50 with less than 8 failed credits and more than 10 earned credits. The acceptable academic performance designation, then, includes all students other than those with poor and low-level performance.

Results



Graph 3-1 2011 Freshman first semester academic performance and present enrollment status

Graph 3.1 is based on the observed frequencies prepared in the chi-square test (for goodness of fit) and shows that ① 53.3% (40/75) of the students in the poor academic performance category at the end of the first semester of their freshman year have dropped out, while another 20% (15/75) were unable to meet the requirements to enroll in the junior year seminar, ② 24.5% (13/53) of the students in the low academic performance category have dropped out, while nearly all the rest managed to meet the requirements to enroll in the junior year seminar, and ③ only 7.3% (27/370) of the students in the acceptable academic performance category have dropped out, while 91.4% (338/370) are currently enrolled in the junior year seminar.

Discussion

Case Study 3 strongly suggests that academic performance in the freshman first semester is an indicator of progress toward eventual graduation. Specifically, poor academic performance in the first semester of the freshman year results in a high incidence of dropping out or not being able to graduate in 4 years. The progress of students in this category who are still on track to graduating in 4 years will be monitored closely in a later study.

While slightly over 70% (39/53) of the students in the low-level academic performance category are also presently on track to graduating in 4 years, it should be noted that nearly 25% (13/53) of this category have dropped out.

Students in the acceptable academic performance category overwhelmingly (91.4%) were able to advance to the junior year.

No attempt has been made in this case study to relate the reason(s) students gave for dropping out with their academic performance category. The data on the reason(s) is not presently available to our cooperative research group, but even if it were we have reservations that such data would be particularly useful because of the gap between the “real” reason and the “official” reason.

Conclusion

Case Study 1 applied a GPA-based academic performance criteria to the 2013 Freshman Class and produced results similar to those previously reported for the 2012 Freshman Class. Case Study 2 applied the same academic performance criteria to the 2012 Freshman Class at the end of first semester of its sophomore year. The results it produced will establish the baseline for evaluating next year's sophomores. Case Study 3 applied the same academic performance criterion to the 2011 Freshman Class at the end of the first semester of its junior year. Although the 2011 Class was not originally included in the range of our cooperative research, this case study was undertaken to establish a benchmark for evaluating next year's 2012 Class.

The GPA data and the identification of students who exhibit poor or low academic performance undertaken this year and last has produced and evidenced-based system for not only understanding the progress our students make toward a timely graduation but also serves as an early identification system (早期発見制度) for the students with a statistically established higher risk of dropping out and/or requiring more than 4 years to graduate.

The accumulation of this data will continue. Furthermore, there will be an effort to do a factor

analysis of GPA data with the social psychology data and life-style data accumulated by other team members.

Works cited

Kelly, T.M. (2013) Identifying Poor and Low Academic Performance: An Evidence-based Study of Edogawa University Freshmen 江戸川大学紀要、第23号.

Endnotes

- i 396 students matriculated in April 2013. Two students who took a leave of absence during the semester have been omitted from consideration. The number 394 used for rest of this paper represents the number of students who completed the semester.
- ii Readers are referred to project members Professor Fukuda Kazuhiko and Professor Nakamura Shin research reports published in this volume.
- iii Student report cards for the first term were made available to our research team in pdf format by the Administration Office (学務課). To protect student privacy this data has been kept on one portable hard disk and no data or calculations derived from it has been discussed or made available to anyone outside our team prior to the publication of this report.
- iv GPA calculations in this study use only the credits for courses which apply toward the graduation requirement of 128 total credits.