

# Identifying Poor and Low Academic Performance:

An Evidence-based Study of Edogawa University Freshmen

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## 要 約

学業不良・低レベルの学業達成学生の状況をより詳しくより良く理解する為に本研究は江戸川大学の2012年度入学生(473名)の履修登録状況, 取得単位数状況, GPAを検討し, 基本的な統計処理を行った。上記データ分析と例年のドロップアウトした学生の傾向を基にして要注意学生の判定基準を評価し, 新たなより適切な基準を提案した。

**Keywords:** attempted credits, earned credits, GPA, academic guidance, life guidance

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## Introduction

This research examines the first semester data for the 473 Freshmen who matriculated at Edogawa University in 2012 in the following three areas: ①attempted credits (履修登録単位数), ②earned credits (取得単位数), and ③GPA<sup>1</sup>. Although systematic analysis of this type has been undertaken at the departmental level (Kelly & Fukuda 2012), this is the first ever investigation on a university-wide scale. This report introduces the preliminary findings of a larger co-operative research project that has been generously funded by Edogawa University for the 2012 academic year. After a descriptive presentation of the statistics, it will be argued in the discussion that the system presently used at Edogawa University to identify students “needing guidance” (要注意) is flawed on several counts. A new system based on the data will be offered and discussed.

## Method

### Calculations

As the number of attempted credits is not indicated on the students' report card (成績通知書)<sup>2</sup>, 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. The number of credits for each grade was manually counted and then used as the basis for calculating a GPA for each student with the following formula:

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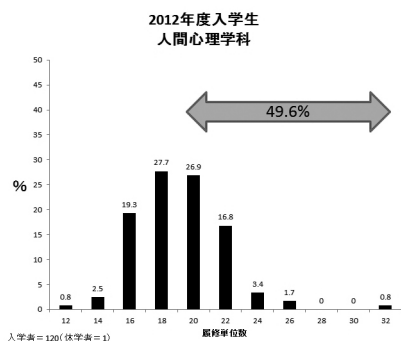
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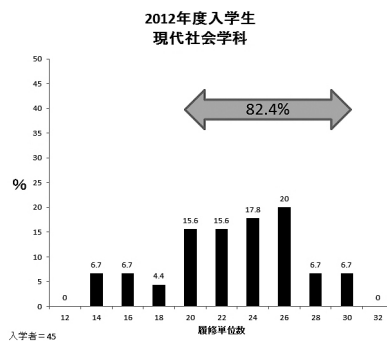
$$\text{GPA} = \frac{(A \times 3) + (B \times 2) + (C \times 1)}{A + B + C + D} \cdot 3$$

## Results

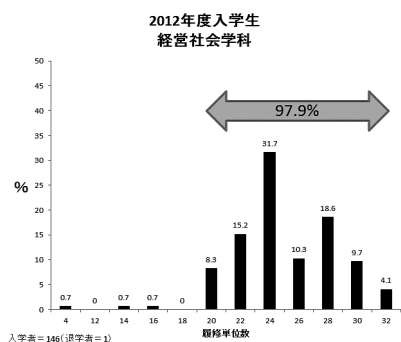
### ① Attempted Credits



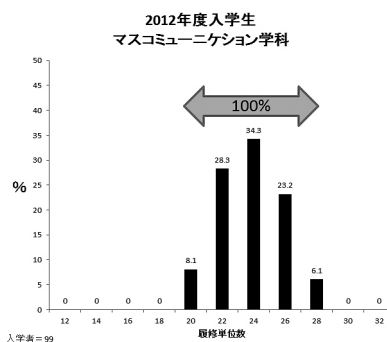
Graph 1-1 Dept. of Psychology &amp; Humanities



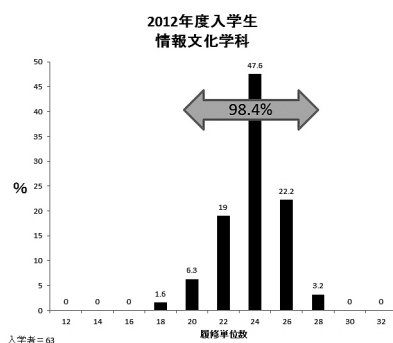
Graph 1-2 Dept. of Contemporary Society



Graph 1-3 Dept. of Business Management



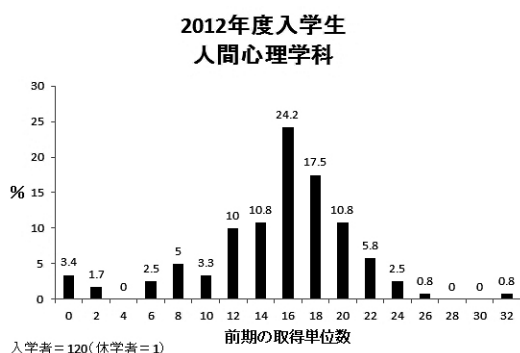
Graph 1-4 Dept. of Mass Communication



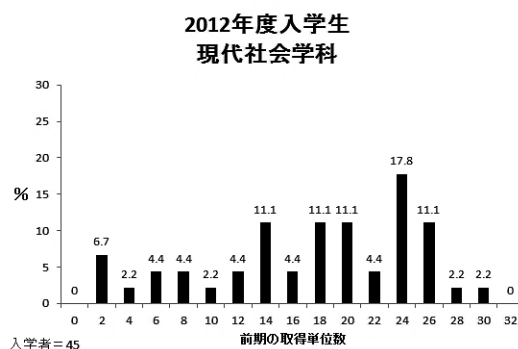
Graph 1-5 Dept. of Business &amp; Communication

Graphs 1-1 through 1-5 are histograms of attempted credits by department. As shown in Graphs 1-3 through 1-5, the number of attempted credits in the departments of Business Management, Mass Communication, and Business & Communication are tightly grouped; 97.2%, 100%, and 98.4% of the students in these three departments respectively registered for between 20 credits and 32 credits for the first semester. Graph 1-2 shows that in the Department of Contemporary Society 82.2% of the students registered for 20 or more credits with the remaining 17.8% were grouped evenly in the 14 to 18 credit range. In contrast to the other departments Graph 1-1 shows that in the Department of Psychology and Humanities only 49.6% registered for 20 or more credits, with 47.1% registered for 16 or 18 credits, while the remaining 3.3% registered for only 12 or 14 credits. 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. Two such courses<sup>4</sup> are compulsory (必修科目), while another<sup>5</sup> is an elective (選択科目) with a nearly 90% rate of registration. Accordingly, for all practical intents the course load of the students in this department should be considered as heavy as that of students in other departments.

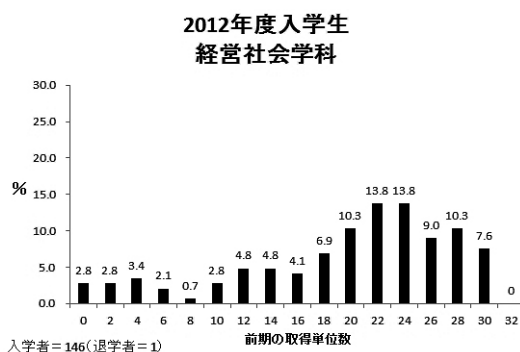
## ② Earned Credits



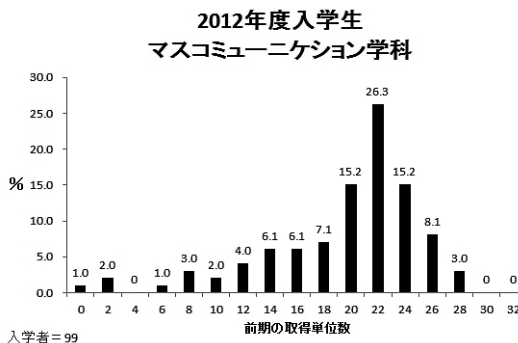
Graph 2-1 Dept. of Psychology & Humanities



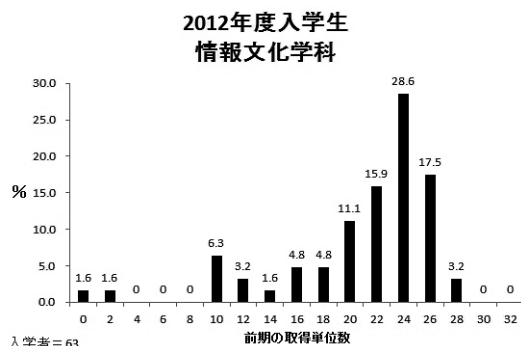
Graph 2-2 Dept. of Contemporary Society



Graph 2-3 Dept. of Business Management



Graph 2-4 Dept. of Mass Communication



Graph 2-5 Dept. of Business &amp; Communication

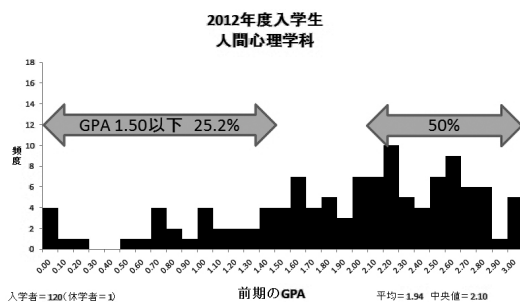
Histograms of earned credits by department are shown in Graph 2-1 through Graph 2-5.

	総合単位数		
	履 修	取 得	取得率
心 理	2,276	1,822	80.1%
現 社	1,020	788	77.3%
経 営	3,620	2,860	79.0%
マスコミ	2,358	1,932	81.9%
情 報	1,502	1,316	87.6%

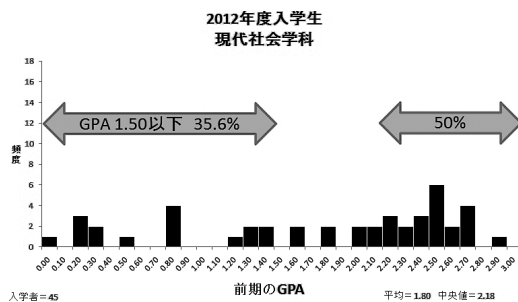
Fig. 1 Percentage of Earned Credits by Department

Fig. 1 shows the percentage of earned credits by department. As noted above, although the students in the Department of Psychology and Humanities carry a course load as heavy as the students in other departments, three year-long courses for which credit is earned at the end of the second term account for the lower number of earned credits in the first term.

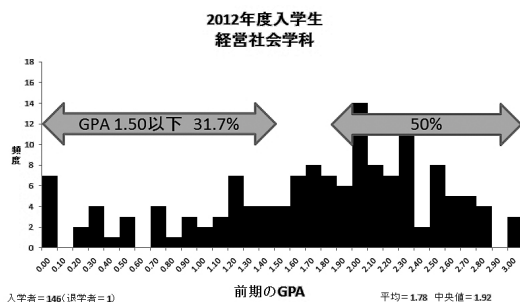
### ③ GPA



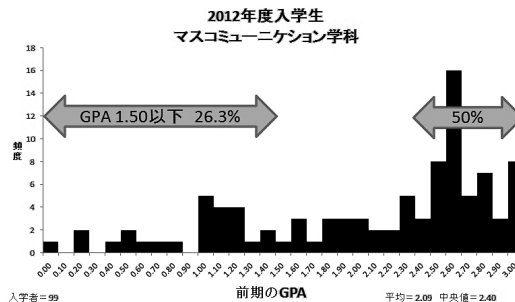
Graph 3-1 Dept. of Psychology &amp; Humanities



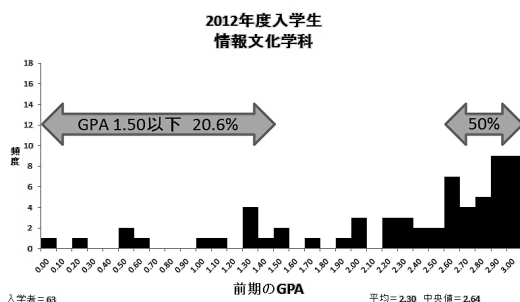
Graph 3-2 Dept. of Contemporary Society



Graph 3-3 Dept. of Business Management



Graph 3-4 Dept. of Mass Communication



Graph 3-5 Dept. of Business &amp; Communication

GPA histograms by department are shown in Graphs 3-1 through 3-5. The median (中央値) GPA for each is also given. The median GPA indicates the score at which 50% of the students in the department have higher scores and 50% have lower scores. In a normal curve distribution the average score and the median score would be the same or close to the same. As shown, the median score for each department is noticeably higher than the average. This means that GPA scores are skewed to the 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 either B or C grades.

## Discussion

### ① Low Earned Credits as the Criterion for Determining Students “Needing Guidance”

At the beginning of the 2012 second term, a list of 64 freshman students or 13.6% of the 471 then enrolled were designated as “needing guidance” (要注意). This list was distributed to each department. The basis for assigning a student to this list was a single criterion: having earned 10 or less credits during the first term.

As seen in Graphs 1-1 through 1-5 above, the number of attempted credits varies not only between departments, but also within departments. This variation in the range of attempted credits alone makes the use of 10 or less earned credits in the first term the criterion a haphazard method for identifying students in need of guidance. Analysis of the 2012 first term “needing

guidance” list showed that 60 of the 64 (93.8%) had failed a minimum of 8 credits. Furthermore, in every one of these 60 cases failing 8 or more credits represented 50% or more of the credits each student had attempted; of the remaining 4 (6.2%) 2 had failed 4 credits and 2 had failed 6 credits. Causally considered, the analysis seems to recommend the criterion, for it did identify a considerable number of students who have had experienced serious trouble in earning credits. It is not clear, however, ①what has happened to the students who have been identified as needing guidance with this criterion, and ②that the criterion has successfully identified all students who had serious academic trouble in the first term.

As shown in Figure 2, in 2011 the 10 or less earned credit criterion was used to identify 69 freshmen in need of guidance.

**Fig. 2 Freshmen designated after the first semester in 2011 as “Needing Guidance” and their current status**

	1 年前期	1 年総合	2 年前期総合	実態状況			1 年前期	1 年総合	2 年前期総合	実態状況	
1	8	32	56	通常	10	38	8	8	休学	休学中	2
2	10	42	54	通常		39	6	12	休学	休学中	
3	6	30	54	通常		40	8	36	36	ドロップアウト	30
4	8	40	48	通常		41	4	10	10	ドロップアウト	
5	10	32	44	通常		42	0	0	0	ドロップアウト	
6	8	34	44	通常		43	6	6	休学	ドロップアウト	
7	10	28	42	通常		44	8	20		ドロップアウト	
8	10	28	42	通常		45	10	14		ドロップアウト	
9	6	6	42	通常		46	4	8		ドロップアウト	
10	8	28	42	通常		47	4	8		ドロップアウト	
11	10	32	40	通常 要注意	27	48	4	6		ドロップアウト	
12	4	20	40	通常 要注意		49	2	2		ドロップアウト	
13	6	22	40	通常 要注意		50	10			ドロップアウト	
14	6	20	40	通常 要注意		51	8			ドロップアウト	
15	8	22	40	通常 要注意		52	6			ドロップアウト	
16	4	22	36	通常 要注意		53	4			ドロップアウト	
17	6	18	34	通常 要注意		54	4			ドロップアウト	
18	6	22	32	通常 要注意		55	4			ドロップアウト	
19	10	18	32	通常 要注意		56	2			ドロップアウト	
20	4	22	32	通常 要注意		57	2			ドロップアウト	
21	8	20	30	通常 要注意		58	0			ドロップアウト	
22	4	20	30	通常 要注意		59	0			ドロップアウト	
23	4	10	28	通常 要注意		60	0			ドロップアウト	
24	2	6	26	通常 要注意		61	0			ドロップアウト	
25	8	18	26	通常 要注意		62	0			ドロップアウト	
26	0	0	24	通常 要注意		63	0			ドロップアウト	
27	10	22	22	通常 要注意		64	0			ドロップアウト	
28	10	20	22	通常 要注意		65	0			ドロップアウト	
29	4	10	22	通常 要注意		66	0			ドロップアウト	
30	2	8	20	通常 要注意		67	未履修			ドロップアウト	
31	6	8	12	通常 要注意		68	未履修			ドロップアウト	
32	0	6	10	通常 要注意		69	未履修			ドロップアウト	
33	2	4	10	通常 要注意							
34	0	2	10	通常 要注意							
35	2	4	4	通常 要注意							
36	4	4	4	通常 要注意							
37	0	0	0	通常 要注意							

Of the 69 identified students 30 (43.5%) have officially dropped out (as of 2012.11.21). Of the 39 other students identified in 2011, two are currently on a leave of absence (休学中) and 37 will be eligible to register for third year seminar on the condition that they will have earned 62 or more credits by the end of the second year. Unfortunately, 27 of the 37 (73%) eligible students are still yet designated as “needing guidance” on the basis of having earned 40 or less credits at the end of three semesters. Exactly how many of them will earn the required 62 or more credits remains to be seen, but given the large number of credits many of them must still earn, it is not difficult to imagine many of them falling short of the required 62. In light of the track record of the students identified in 2011 it must be asked whether the 10 or less earned credits criterion principally identifies many serious cases, particularly those who have or will likely drop out by the end of the second year of enrollment. The high ratio of students who have or will likely drop out to students who will or are likely to earn 62 credits seems to indicate that very few of the 69 students originally identified have benefitted from interventions such as academic guidance (学習指導) and/or life guidance (生活指導)<sup>6</sup>. Would a different criterion identify a group of students who might reasonably be expected to benefit from academic support (学習支援)? Before turning to this question, the capacity of the 10 or less earned credits criterion at identifying all cases of questionable academic performance must be considered.

2012 前期終了の1年要注意生				
	1.0 以下	1.5 以下	1.5 以上	
心 理	19	16	2	1
現 社	9	8	1	0
経 営	21	20	1	0
マスコミ	9	9	0	0
情 報	6	4	2	0
合 計	64	57	6	1
		89.06%	9.38%	1.56%

**Fig. 3 Freshmen designated after the first semester in 2012 as “Needing Guidance” by department and GPA**

As seen in Figure 3 in the 2012 first semester 63 of the 64 freshmen (98.4%) who earned 10 or less earned credits had a GPA of 1.50 or less and also 57 or (89%) actually had a GPA of 1.00 or less. In that nearly 90% of the students on the list had GPAs of 1.00 or less, a simple test of the 10 or less earned credit criterion is to ask whether it identified all or nearly all students with a GPA of 1.00 or less.

Figure 4 shows that the current model for designating students who need guidance failed to identify 14 of 71 students (19.7%) of all students with a GPA of 1.00 or less. In terms of academic performance a GPA of 1.00 or less is seriously deficient. In that the current model failed to account for nearly 20% of the students with such poor academic performance on what grounds can it be justified as the sole criterion for selecting students in need of guidance?

		全1年生 1.0 以下	要注意決定 1.0 以下	差
心 理		17	16	1
現 社		11	8	3
経 営		26	20	6
マスコミ		11	9	2
情 報		6	4	2
合 計		71	57	14
		19.72%		

**Fig. 4 Freshmen with a GPA 1.00 or less vs. Freshmen designated “Needing Guidance” by department**

The assumption implicit in the current model is that earning 12 or more credits means that a student is making acceptable progress. That this assumption is untenable is clearly seen in the case of a student registered for 28 credits, earning 12 and failing 16 with a GPA of 0.71. Despite failing 16 credits (57.1%) of the attempted credits, this student was not included among the officially designated “needing guidance” students by virtue of having earned 12 credits. This is not an oversight, but rather a systemic failure and moreover a failure which has perpetuated itself because the model has never been tested for statistical significance based on available data. The present research has shown the inadequacy of the current standard and will propose a three criteria model to replace it. This model is based on an analysis of concrete data and will require testing on future data to determine its suitability and reliability.

## ② Toward a New Model for Determining Students “Needing Guidance”

As the primary standard for determining which students should be designated “needing guidance” a GPA of 1.50 or lower is proposed. This is not an arbitrary figure but is based on the fact that earning a GPA above 1.50 requires in all cases that a student earn more than half of the credits attempted. Adopting a GPA standard has two benefits: ① it will eliminate the present system’s bias in favor of students whose curriculum does not have year-long courses and can thereby registered for and earn a large number of credits in the first semester (see Graph 1-1 through 1-5 for the range of registered credits by department) because it is performance based relative to the number of credits attempted, and ② it can be applied to each individual semester as well as to the cumulative GPA.

To complement the GPA criterion a secondary criterion is needed. For the 38 (8%) of the 471 students attempting 16 or less credits during the first term failing 8 credits would automatically result in a GPA of 1.50 or less and therefore identify them as “needing guidance” under the primary criterion. For students who attempt a larger number of credits it is unlikely that 8 or more failure credits is excessively strict as a criterion. Subject to further testing the proposed model will assume 8 or more failed credits in any semester as the standard for all students. For example, a student who registers for 32 credits earns 24 credits of A and fails 8 credits would receive a GPA

of 2.25, which in both terms of credits earned and GPA can certainly not be considered low. Even if such a student has no problems that require intervention, at the very least the reason(s) for failing those 8 credits should be determined and, if necessary, the student cautioned about attempting such a heavy course load and about the impact that 8 failed credits has on GPA. Based on the 2012 data, of the 113 students who had 8 or more failed credits 108 (95.6%) had already been identified by the GPA 1.50 or less primary criterion; the remaining 5 (4.4%) had exactly 8 failed credits and GPAs of 1.56 for 24 earned credits, 1.6 for 12 earned credits, 1.69 for 18 earned credits, 1.81 for 24 earned credits, and 1.85 for 18 earned credits. The percentage of failed credits to credits attempted for these five students ranged from 25% to 40%<sup>7</sup>. The purpose of the secondary criterion, then, is to identify the few students who escaped notice by the primary criterion, but have failed many credits.

As a third and final criterion, the earned credits of 10 or less standard currently in use must be maintained because it is possible for students who register for 16 or less credits to clear the first two criteria while earning only 10 credits. For example, registering for 16 credits, earning 10 with A and failing 6 credits (clearing criterion #2) would result in a GPA of 1.88 (clearing #1). In practice this criterion will seldom be needed. Based on the 2012 data, of 471 students 36 (7.6%) registered for 16 or less credits; of those 36 students only 1 student (2.8%) managed to achieve a GPA of 1.57 (clearing criterion #1) while earning 10 credits and failing 6 (clearing criterion #2).

### ③ Toward an Improved System for Supporting Students' Academic Performance

The three criteria model proposed above identified every student designated by the current model in addition to identifying students who despite poor academic performance were missed by the current model. It furthermore identifies many more students with low academic performance as shown in Figure 5 below.

		全1年生 1.5 以下	要注意決定 1.5 以下	差
心 理		13	2	11
現 社		5	1	4
経 営		20	1	19
マスコミ		15	0	15
情 報		7	2	5
合 計		60	6	54
				90%

**Fig. 5 Freshmen with a GPA 1.50 or less vs. Freshmen designated “Needing Guidance” by department**

What is the expected workload increase created by the new model? In addition to the 64 students already designated “needing guidance” the new model identifies 73 others. Figure 6 shows by department what the increase workload would have been under the proposed system.

提案された基準による学習支援の増加学生数				
	1.0 以下	1.5 以下	1.5 以上	
心 理	13	1	11	1
現 社	7	3	4	0
経 営	27	6	19	2
マスコミ	19	2	15	2
情 報	7	2	5	0
合 計	73	14	54	5

**Fig. 6 Increased workload by department were the proposed system used for the 2012 first semester**

## Conclusion

The present standard of 10 or less earned credits is primarily a tool for identifying students whose first semester progress in terms of credits earned is well below the level of the other students in their respective departments. In light of the data for students who matriculated in 2011 it is not an exaggeration to say that it basically identifies students who have dropped out (30 of 69) or those who will likely drop out after failing to earn the requisite 62 credits for enrolling in the compulsory third year seminar. Other than some anecdotal stories there is no documentation that demonstrates that any efforts at academic and life guidance for students flagged by the 10 credit or less standard after their first semester has had significant impact.

The three criteria model proposed in this research report goes beyond identifying students whose poor academic performance (学業不良 GPA  $\leq 1.00$ ) makes them likely dropouts. It also identifies those students whose low academic performance (低レベル学業 GPA  $> 1.00 \leq 1.50$ ), low especially when considered relative to the median score of each department, is a strong indicator that they are also in need of guidance. This is not to say that providing guidance to low academic performance should take precedence over students with poor academic performance. It is rather to suggest that assuming that they are sufficiently motivated, students with poor academic performance in the first term of university may require specialized guidance while, on the other hand, students with low academic performance could well benefit from academic and life-style guidance. It is proposed that early identification of these low academic performance students and suitable guidance will result in an improvement not only of their level of academic progress in terms of GPA and earned credits but also increase their chances of a timely graduation.

It is hoped that the three criteria model proposed above will receive due attention in the appropriate committees.

## Endnotes

- 1 473 students matriculated in April 2012. The one student who dropped out and the one student who took a leave of absence during the semester have been omitted from consideration. The number 471 used for rest of this paper represents the number of students who completed the semester.

- 2 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.
- 3 GPA calculations in this study are based only the credits for courses which apply toward the graduation requirement of 128 total credits.
- 4 Specifically, Statistics for Psychology (心理統計学) and Introduction to Psychology (心理学概論).
- 5 Specifically, Child Psychology (児童心理学).
- 6 In passing it needs to be asked whether all the attention and effort to “rescue” a few students has had any impact on decreasing the dropout rate.
- 7 The two students who earned 24 credits may arguably be making acceptable progress in terms of earned credits; however, it is important to recognize that they also failed 8 credits (25%) of the 32 attempted credits. These failed credits had a large negative impact on their GPAs.

In passing it should be furthered noted that of the 7 students of 471 (1.5%) who registered for 32 credits in the first term, only one actually earned all 32 credits. This suggests that registering for so many credits may either be overly ambitious or that some students may be over-registering and then giving up on some of them.

#### Works cited

Kelly, T. M. and Fukuda Kazuhiko (2012) 大学生の学業達成度に関する検討：特に学力テスト, GPA, 入学種別の関連について 江戸川大学紀要, 第 22 号.