

# Major Changes and Persistence Patterns

August 2011

## Highlights:

- ❖ On average, about 37% of incoming new undergraduates change their major at least once.
- ❖ Each change in major increases the time to graduation by about a half a semester.
- ❖ It appears that the average credits at each major change have been steadily decreasing over time.

There has been a desire on campus to be able to identify and better understand student retention including the patterns of major changes that occur. In the past, there have been a variety of data constraints that made this type of research an arduous and somewhat manual process. The main constraint for trend analysis of this type is that the central Operational Data Store (ODS) does not track changes in major codes and descriptions over time.

Major codes have changed and continue to change over time because of a variety of reasons including:

1. All of the major codes changed in FA07 because of the new ARIES student system.
2. Major codes change when a major moves from one department to another. E.g. The major Bioresource & Agri Engr changed codes from CB90 to CE91, when the major was moved from the department “Chemical & Bioresource Engineering” to “Civil Engineering”.
3. Major codes may also change when the major description changes. E.g. “Landscape Horticulture” was renamed to “Environmental Horticulture”. Thus the major code “LAND” became “ENHR”.

To overcome this main data constraint, Institutional Research created a unique identification code for all majors, concentrations, and specializations going back to fall 1990. The process was time consuming and required collaboration with Information Systems and the Registrar’s Office. The current five part analysis is the first use of this new data model.

**Research Questions**

- 1) What percent of students change majors and how many times?
- 2) What is the average time to graduation by the number of major changes?
- 3) What are the average credits at each major change?
- 4) What are the major change patterns within and among colleges?
- 5) To which majors did graduates change?

In the current analysis, open option majors are excluded. Entry major is a student’s first non-open option major. Students who enroll in an open option major, subsequently do not enroll in any other major and then do not persist are excluded.

**1) What percent of students change majors and how many times?**

On average, about 37% of incoming new undergraduates change their major at least once. However, the vast majority do not change more than twice. Table 1 displays the change rates by cohort and the number of changes made.

Table 1.

<b>Cohort</b>	<b>Cohort Size</b>	<b>Adjusted Cohort Size</b>	<b>1 Change</b>	<b>2 Changes</b>	<b>3 Changes</b>	<b>4 Changes</b>	<b>5 Changes</b>
FA05	3,807	3,425	38.9	13.6	2.2	0.2	0.0
FA06	3,971	3,573	36.5	10.9	2.2	0.2	0.1
FA07	4,288	3,937	37.2	9.9	1.5	0.2	
FA08	4,308	3,908	37.4	8.6	1.0	0.1	
FA09	4,203	3,387	36.6	4.1	0.0		
<b>Grand Total</b>	<b>4,115</b>	<b>3,646</b>	<b>37.3</b>	<b>9.4</b>	<b>1.4</b>	<b>0.2</b>	<b>0.0</b>

**2) What is the average time to graduation by the number of major changes?**

The average time to graduation for students who do not change their major is about 12 semesters. It appears that each change in major increases that time to graduation by about half a semester. Table 2 displays the average semesters to graduation by cohort and the number of changes made.

Table 2.

<b>Cohort</b>	<b>Count of Graduates</b>	<b>0 Changes</b>	<b>1 Change</b>	<b>2 Changes</b>	<b>3 Changes</b>	<b>4 Changes</b>	<b>5 Changes</b>
FA00	3,208	12.3	13.2	14.1	13.7		
FA01	3,631	12.4	12.7	14.0	16.0	16.0	
FA02	3,735	12.3	13.0	14.2	14.5	17.2	
FA03	3,724	11.9	12.8	13.5	14.2	13.4	17.0
FA04	3,996	12.1	12.2	12.4	13.0	12.6	
FA05	3,807	11.8	11.9	12.2	12.3	12.3	14.0
<b>Average</b>	<b>3,684</b>	<b>12.1</b>	<b>12.6</b>	<b>13.4</b>	<b>13.9</b>	<b>14.3</b>	<b>15.5</b>

Note: Cohorts after fall 2005 are not shown because they have not had the benefit of six years to graduate and therefore skew the results.

**3) What are the average credits at each major change?**

It appears that the average credits at each major change have been steadily decreasing over time. This may account for the increasingly similar time to graduation for students who change once and students who graduate with their entry-major. Table 3 displays the average number of credits at each major change by cohort and the number of changes made.

Table 3.

<b>Cohort</b>	<b>Cohort Size</b>	<b>1st Change</b>	<b>2nd Change</b>	<b>3rd Change</b>	<b>4th Change</b>	<b>5th Change</b>
FA05	3,807	50.5	68.6	81.4	102.5	118.0
FA06	3,971	40.7	58.4	72.0	74.1	86.0
FA07	4,288	34.5	54.3	65.9	76.0	65.0
FA08	4,308	27.4	44.1	54.6	58.7	
FA09	4,203	18.6	29.7	31.0		
<b>Average</b>	<b>4,115</b>	<b>34.3</b>	<b>51.0</b>	<b>61.0</b>	<b>77.8</b>	<b>89.7</b>

**4) What are the major change patterns within and among colleges for graduates?**

Most graduates that change majors do not go outside their entry-college to do so. Table 4 provides the number of changes among colleges by cohort year for graduates. The College of Liberal Arts benefits the most from changes among colleges receiving the most major changes from Natural Sciences. The College of Engineering benefits the least. Again, cohorts after fall 2005 are not shown because they have not had the benefit of six years to graduate and therefore skew the results.

Table 4.

<b>Graduation-College by Entry-College</b>							<b>Grand Total</b>
	<b>FA00</b>	<b>FA01</b>	<b>FA02</b>	<b>FA03</b>	<b>FA04</b>	<b>FA05</b>	
<b>Agricultural Sciences</b>	<b>150</b>	<b>132</b>	<b>140</b>	<b>125</b>	<b>127</b>	<b>141</b>	<b>815</b>
Agricultural Sciences	117	111	123	105	108	130	694
Applied Human Sciences	1	2	4	1	2	2	12
Business	3		2		2		7
Engineering	3	2	4	6	2	1	18
Liberal Arts	4	6	3	5	2	1	21
Natural Sciences	5	3	4	5	8	6	31
Veterinary Medicine + Biomedical Sci	13	8			1		22
Warner College of Natural Resources	4			3	2	1	10
<b>Applied Human Sciences</b>	<b>360</b>	<b>458</b>	<b>534</b>	<b>539</b>	<b>608</b>	<b>521</b>	<b>3,020</b>
Agricultural Sciences	5	1	9	5	8	6	34
Applied Human Sciences	252	332	407	400	441	396	2,228
Business	8	8	14	7	13	6	56
Engineering	17	15	26	20	20	18	116
Intra-University	1						1
Liberal Arts	24	45	33	36	45	34	217
Natural Sciences	42	48	38	65	69	54	316
Veterinary Medicine + Biomedical Sci	6	4	3	1	8	6	28
Warner College of Natural Resources	5	5	4	5	4	1	24

Table 4 (continued).

<b>Graduation-College by Entry-College</b>							<b>Grand</b>
	<b>FA00</b>	<b>FA01</b>	<b>FA02</b>	<b>FA03</b>	<b>FA04</b>	<b>FA05</b>	<b>Total</b>
<b>Business</b>	<b>425</b>	<b>450</b>	<b>358</b>	<b>349</b>	<b>344</b>	<b>330</b>	<b>2,256</b>
Agricultural Sciences	2	2	4		4	3	15
Applied Human Sciences	10	9	11	14	11	9	64
Business	355	364	293	288	293	286	1,879
Engineering	18	18	15	14	12	6	83
Liberal Arts	8	16	13	18	12	9	76
Natural Sciences	29	37	21	14	11	9	121
Veterinary Medicine + Biomedical Sci	1				1	2	4
Warner College of Natural Resources	2	4	1	1		6	14
<b>Engineering</b>	<b>168</b>	<b>190</b>	<b>171</b>	<b>174</b>	<b>193</b>	<b>99</b>	<b>995</b>
Agricultural Sciences	1						1
Applied Human Sciences	1	1				1	3
Business		1			1	1	3
Engineering	158	180	163	167	187	89	944
Liberal Arts			2	2			4
Natural Sciences	7	7	5	5	5	7	36
Veterinary Medicine + Biomedical Sci						1	1
Warner College of Natural Resources	1	1	1				3
<b>Liberal Arts</b>	<b>577</b>	<b>650</b>	<b>723</b>	<b>719</b>	<b>727</b>	<b>665</b>	<b>4,061</b>
Agricultural Sciences	6	7	5	6	7	9	40
Applied Human Sciences	19	38	38	44	44	49	232
Business	13	14	6	20	18	12	83
Engineering	19	18	20	18	11	22	108
Intra-University				1			1
Liberal Arts	444	500	578	553	560	514	3,149
Natural Sciences	61	57	65	68	67	54	372
Veterinary Medicine + Biomedical Sci	8	8	1	3	11	1	32
Warner College of Natural Resources	7	8	10	6	9	4	44

Table 4 (continued).

<b>Graduation-College by Entry-College</b>							<b>Grand</b>
	<b>FA00</b>	<b>FA01</b>	<b>FA02</b>	<b>FA03</b>	<b>FA04</b>	<b>FA05</b>	<b>Total</b>
<b>Natural Sciences</b>	<b>323</b>	<b>403</b>	<b>367</b>	<b>396</b>	<b>409</b>	<b>311</b>	<b>2209</b>
Agricultural Sciences	4	3	5	5	12	11	40
Applied Human Sciences	9	10	10	11	9	13	62
Business		5	3	2	4	1	15
Engineering	15	23	19	23	17	10	107
Liberal Arts	9	14	15	14	26	11	89
Natural Sciences	268	311	309	333	333	258	1,812
Veterinary Medicine + Biomedical Sci	13	32	3	7	5	4	64
Warner College of Natural Resources	5	5	3	1	3	3	20
<b>Veterinary Medicine + Biomedical Sci</b>	<b>58</b>	<b>72</b>	<b>52</b>	<b>58</b>	<b>61</b>	<b>103</b>	<b>404</b>
Agricultural Sciences	1	1	4		1	4	11
Applied Human Sciences		2	1	1			4
Business					1		1
Engineering	4	3	1	2	1	1	12
Liberal Arts		1		1	1	4	7
Natural Sciences	8	11	8	12	9	22	70
Veterinary Medicine + Biomedical Sci	44	53	35	42	48	72	294
Warner College of Natural Resources	1	1	3				5
<b>Warner College of Natural Resources</b>	<b>93</b>	<b>89</b>	<b>120</b>	<b>101</b>	<b>112</b>	<b>98</b>	<b>613</b>
Agricultural Sciences	1	2	1	3	5	2	14
Applied Human Sciences	1		4	7	3	4	19
Business	1	3	1	3	1	2	11
Engineering	7	6	6	7	3	6	35
Liberal Arts	1	6	3	2	8	2	22
Natural Sciences	7	6	10	7	11	9	50
Veterinary Medicine + Biomedical Sci		5			1	3	9
Warner College of Natural Resources	75	61	95	72	80	70	453
<b>Grand Total</b>	<b>2,154</b>	<b>2,444</b>	<b>2,465</b>	<b>2,461</b>	<b>2,581</b>	<b>2,268</b>	<b>14,373</b>

**5) To which majors did graduates change?**

Table 5 displays the graduation-majors in bold above each entry-major for graduation-majors receiving more than 15 students from another entry-major. Majors not shown did not receive more than 15 students in any cohort. A full list of graduation-majors by entry-majors is available upon request.

Table 5.

	FA01	FA02	FA03	FA04	FA05	Grand Total
<b>Accounting</b>	<b>23</b>	<b>25</b>	<b>15</b>	<b>15</b>	<b>34</b>	<b>112</b>
Business Administration	23	25	15	15	34	112
<b>Biological Science</b>			<b>28</b>	<b>75</b>	<b>59</b>	<b>162</b>
Biological Science			28	75	59	162
<b>Civil Engineering</b>			<b>18</b>	<b>45</b>	<b>20</b>	<b>83</b>
Civil Engineering			18	45	20	83
<b>Creative Writing</b>				<b>19</b>	<b>16</b>	<b>35</b>
English				19	16	35
<b>Criminology and Criminal Justice</b>				<b>22</b>		<b>22</b>
Sociology				22		22
<b>English Education</b>					<b>20</b>	<b>20</b>
English					20	20
<b>Finance</b>			<b>54</b>	<b>60</b>	<b>52</b>	<b>166</b>
Business Administration			34	60	52	146
Finance-Real Estate			20			20
<b>Finance-Real Estate</b>	<b>42</b>	<b>34</b>				<b>76</b>
Business Administration	42	34				76
<b>Graphic Design</b>					<b>21</b>	<b>21</b>
Art					21	21
<b>Health Promotion</b>			<b>21</b>	<b>42</b>	<b>27</b>	<b>90</b>
Health and Exercise Science			21	42	27	90
<b>Human Devlpmnt &amp; Family Stdies</b>					<b>15</b>	<b>15</b>
Psychology					15	15
<b>Liberal Arts</b>				<b>29</b>	<b>24</b>	<b>53</b>
History				29	24	53
<b>Management</b>	<b>20</b>	<b>20</b>	<b>17</b>			<b>57</b>
Business Administration	20	20	17			57
<b>Marketing</b>	<b>55</b>	<b>38</b>	<b>31</b>	<b>57</b>	<b>78</b>	<b>259</b>

Table 5 (continued).

	FA01	FA02	FA03	FA04	FA05	Grand Total
Business Administration	55	38	31	57	78	259
<b>Merchandising</b>				<b>28</b>	<b>36</b>	<b>64</b>
Apparel and Merchandising				28	36	64
<b>Natural Resource Tourism</b>				<b>23</b>		<b>23</b>
Natural Resrce Recr & Tourism				23		23
<b>Organization and Innovation Management</b>				<b>50</b>	<b>31</b>	<b>81</b>
Business Administration				50	31	81
<b>Public Relations</b>				<b>36</b>	<b>30</b>	<b>66</b>
Journalism and Technical Comm				36	30	66
<b>Real Estate</b>				<b>15</b>	<b>19</b>	<b>34</b>
Business Administration				15	19	34
<b>Sports Medicine</b>			<b>15</b>	<b>59</b>	<b>56</b>	<b>130</b>
Health and Exercise Science			15	59	56	130
<b>Television News and Video Communication</b>				<b>16</b>	<b>17</b>	<b>33</b>
Journalism and Technical Comm				16	17	33