Talk Outline

1. Updated peer comparisons for 2nd-year retention
   - most recently available data from IPEDS
   - retention vs. SAT scores

2. Updates (minor) to the second-year retention model
   - added gender
   - added HSGPA x residency interaction
   - added additional model assessment metrics

3. Transfer retention
   - students arriving with $\geq 30$ credit hours
   - students arriving with $< 30$ credit hours
1. Updated peer comparisons for retention
### WMU retention compared to 4-Year Michigan Public Schools

Second year retention (%) for full-time, first-year students (2016 cohorts)

<table>
<thead>
<tr>
<th>University</th>
<th>Retention (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Michigan-Ann Arbor</td>
<td>97%</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>91%</td>
</tr>
<tr>
<td>Michigan Technological University</td>
<td>83%</td>
</tr>
<tr>
<td>Grand Valley State University</td>
<td>83%</td>
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<tr>
<td>Wayne State University</td>
<td>81%</td>
</tr>
<tr>
<td>University of Michigan-Dearborn</td>
<td>81%</td>
</tr>
<tr>
<td>Ferris State University</td>
<td>79%</td>
</tr>
<tr>
<td>Western Michigan University</td>
<td>78%</td>
</tr>
<tr>
<td>Northern Michigan University</td>
<td>78%</td>
</tr>
<tr>
<td>University of Michigan-Flint</td>
<td>77%</td>
</tr>
<tr>
<td>Oakland University</td>
<td>77%</td>
</tr>
<tr>
<td>Central Michigan University</td>
<td>77%</td>
</tr>
<tr>
<td>Saginaw Valley State University</td>
<td>74%</td>
</tr>
<tr>
<td>Eastern Michigan University</td>
<td>72%</td>
</tr>
<tr>
<td>Lake Superior State University</td>
<td>67%</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Credit: Office of Institutional Research | Western Michigan University
WMU retention compared to Carnegie Peers

Second year retention (%) for full-time, first-year students (2016 cohorts)

- Binghamton University: 91%
- The University of Alabama: 87%
- East Carolina University: 83%
- University of North Dakota: 81%
- Oklahoma State University: 81%
- Ohio University: 80%
- Kent State University at Kent: 80%
- Western Michigan University: 78%
- University of North Carolina at Greensboro: 78%
- Ball State University: 78%
- Northern Arizona University: 76%
- University of Memphis: 75%
- University of Nevada-Las Vegas: 74%
- Northern Illinois University: 73%
- Portland State University: 72%
- University of Southern Mississippi: 71%


Credit: Office of Institutional Research | Western Michigan University
WMU retention compared to MAC Schools
Second year retention (%) for full-time, first-year students (2016 cohorts)

- Miami University-Oxford: 91%
- University at Buffalo: 87%
- Ohio University: 80%
- Kent State University at Kent: 80%
- Western Michigan University: 78%
- Ball State University: 78%
- Central Michigan University: 77%
- Bowling Green State University: 77%
- University of Toledo: 74%
- University of Akron: 73%
- Northern Illinois University: 73%
- Eastern Michigan University: 72%

Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.
Credit: Office of Institutional Research | Western Michigan University
WMU retention compared to other large U.S. Universities

Second year retention (%) for full-time, first-year students (2016 cohorts)

Notes
Includes all U.S. Universities that are categorized as 'Degree granting; primarily Bachelor and above' with at least 20,000 enrolled students

Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Credit: Office of Institutional Research | Western Michigan University
**WMU test scores and retention compared to peer institutions**

Second year retention (%) by 25th percentile ACT Composite scores, for full-time, first-year students (2015 cohorts). WMU is highlighted in Gold.

- **Michigan Public Universities**
  - n = 15

- **Carnegie Peers**
  - n = 9

- **MAC Universities**
  - n = 10

- **Similar U.S. Universities**
  - n = 52

25th percentile ACT score

'Similar U.S. Universities' are defined as 'Degree granting; primarily Bachelor and above' with 20,000+ annual enrollment. Only universities with >75% of incoming students reporting ACT scores are included. Dotted line indicates the best-fit least-squares regression.


Credit: Office of Institutional Research | Western Michigan University
WMU test scores and retention compared to peer institutions

Second year retention (%) by 25th percentile SAT Math scores, for full-time, first-year students (2016 cohorts). WMU is highlighted in Gold.

Michigan Public Universities

Similar U.S. Universities

25th percentile SAT Math score

n = 13

R² = 0.62
n = 65

'Similar U.S. Universities' are defined as 'Degree granting; primarily Bachelor and above' with 20,000+ annual enrollment. Only universities with >65% of incoming students reporting SAT scores are included. Dotted line indicates the best-fit least-squares regression.

Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Credit: Office of Institutional Research | Western Michigan University
WMU test scores and retention compared to peer institutions

Second year retention (%) by 25th percentile SAT Read/Write scores, for full-time, first-year students (2016 cohorts). WMU is highlighted in Gold.

Michigan Public Universities

Similar U.S. Universities

25th percentile SAT Read/Write score

'n = 13

$R^2 = 0.63$

n = 65

'Similar U.S. Universities' are defined as 'Degree granting; primarily Bachelor and above' with 20,000+ annual enrollment. Only universities with >65% of incoming students reporting SAT scores are included. Dotted line indicates the best-fit least-squares regression.

Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Credit: Office of Institutional Research | Western Michigan University
2. Updates to the second-year retention model
1. All results use data from the *six most recent (2012-2017) FTIAC cohorts*

2. Prior to fitting the model the data were randomly divided into:

   - **training**: 5/6 of the full data set used to 'fit' the model (i.e. estimate the parameters)

   - **testing**: 1/6 of the full data set used to 'test' the fitted model's ability to correctly predict retention
WMU Retention Model: Continuous and Binary Marginal Effects

Posterior summaries (median +/- 90%) for all individual-level parameters. Estimates are reported as the effect on the probability (in percentage points) of a FTIAC returning for a second year.

- HSGPA (domestic residents)
- Lives on campus
- HSGPA (domestic non-residents)
- No. of AP/IB courses
- HSGPA (international)
- Expected Family Contribution
- Female

Continuous effects are scaled to a change of 1 standard deviation. Binary effects are not relative to the 'average' student: the 'Female' effect is relative to Males, and 'Lives on Campus' is relative to students living off campus.

Original data source: WMU Banner ODS Data Warehouse and Banner ODS Census Extracts.

Credit: Office of Institutional Research | Western Michigan University
WMU Retention Model: Marginal Effect of High School GPA

Estimated marginal probability (%) of a FTIAC returning for a second year over the full range of HSGPA values

The gray ribbon around the trendline illustrates the estimated uncertainty (90% posterior probability) in the effect size. The raw retention data are plotted as rugs at the top and bottom of the figure.

Original data source: WMU Banner ODS Data Warehouse and Banner ODS Census Extracts.

Credit: Office of Institutional Research | Western Michigan University
WMU Retention Model: "Goodness-of-fit"

Posterior distribution of the pseudo r-squared statistic for the full model applied to the training and testing data subsets.

Median r_squared
- training (0.07)
- testing (0.05)

Psuedo r-squared calculated as: (Null Deviance - Fitted Deviance)/(Null Deviance). A r-squared value of 1 is equivalent to a fully saturated model.

Original data source: WMU Banner ODS Data Warehouse and Banner ODS Census Extracts.

Credit: Office of Institutional Research | Western Michigan University
WMU Retention Model: Model Classification Success

Posterior accuracy, sensitivity, and specificity of a random, intercept-only, and the full fitted model measured against the testing data subset.

Original data source: WMU Banner ODS Data Warehouse and Banner ODS Census Extracts.

Credit: Office of Institutional Research | Western Michigan University
3. Transfer retention
Transfer students with at least 30 credit hours:

### University-wide Retention Rates

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Cohort Count</th>
<th>to year 2</th>
<th>to year 3</th>
<th>to year 4</th>
<th>to year 5</th>
<th>to year 6</th>
<th>to year 7</th>
<th>to year 8</th>
<th>to year 9</th>
<th>to year 10</th>
<th>to year 11</th>
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</thead>
<tbody>
<tr>
<td>2008</td>
<td>851</td>
<td>82.6%</td>
<td>62.8%</td>
<td>30.5%</td>
<td>10.0%</td>
<td>4.2%</td>
<td>2.8%</td>
<td>1.9%</td>
<td>0.9%</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>2009</td>
<td>777</td>
<td>82.5%</td>
<td>58.5%</td>
<td>28.7%</td>
<td>9.9%</td>
<td>3.9%</td>
<td>2.2%</td>
<td>1.2%</td>
<td>1.0%</td>
<td>0.8%</td>
<td></td>
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<tr>
<td>2010</td>
<td>917</td>
<td>81.8%</td>
<td>59.9%</td>
<td>27.8%</td>
<td>11.1%</td>
<td>4.2%</td>
<td>2.2%</td>
<td>1.6%</td>
<td>1.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>855</td>
<td>80.0%</td>
<td>60.2%</td>
<td>30.0%</td>
<td>9.7%</td>
<td>4.7%</td>
<td>1.5%</td>
<td>1.0%</td>
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<tr>
<td>2012</td>
<td>930</td>
<td>81.4%</td>
<td>61.5%</td>
<td>28.3%</td>
<td>11.2%</td>
<td>4.4%</td>
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<tr>
<td>2013</td>
<td>812</td>
<td>77.9%</td>
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<td>28.4%</td>
<td>9.0%</td>
<td>4.6%</td>
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<td>2014</td>
<td>844</td>
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<td>58.0%</td>
<td>24.0%</td>
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<tr>
<td>2015</td>
<td>792</td>
<td>82.2%</td>
<td>60.3%</td>
<td>25.6%</td>
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<td>2016</td>
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<td>58.1%</td>
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<tr>
<td>2017</td>
<td>786</td>
<td>82.2%</td>
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</tr>
</tbody>
</table>

**Note:**
Rates are calculated for transfer student cohorts as defined by the Consortium for Student Retention Data Exchange (CSRDE). These cohorts include all new transfer students that: (1) arrived with at least 30 transfer credit hours (2) never attended a 4-year institution prior to WMU and (3) started in the Summer II or Fall terms (grouped together into a single cohort).

Original data source: WMU Banner ODS Data Warehouse and Banner ODS Census Extracts.

Credit: Office of Institutional Research | Western Michigan University
Transfer students with less than 30 credit hours:

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Cohort Count</th>
<th>to year 2</th>
<th>to year 3</th>
<th>to year 4</th>
<th>to year 5</th>
<th>to year 6</th>
<th>to year 7</th>
<th>to year 8</th>
<th>to year 9</th>
<th>to year 10</th>
<th>to year 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>267</td>
<td>63.2%</td>
<td>55.6%</td>
<td>40.2%</td>
<td>18.1%</td>
<td>6.8%</td>
<td>2.3%</td>
<td>2.6%</td>
<td>0.8%</td>
<td>0.8%</td>
<td>0.8%</td>
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<tr>
<td>2009</td>
<td>224</td>
<td>70.5%</td>
<td>58.5%</td>
<td>44.2%</td>
<td>17.0%</td>
<td>6.2%</td>
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<td>1.8%</td>
<td>0.9%</td>
<td>0.5%</td>
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</tr>
<tr>
<td>2010</td>
<td>277</td>
<td>70.3%</td>
<td>60.1%</td>
<td>42.4%</td>
<td>15.9%</td>
<td>6.2%</td>
<td>4.4%</td>
<td>2.2%</td>
<td>1.1%</td>
<td></td>
<td></td>
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<tr>
<td>2011</td>
<td>314</td>
<td>67.2%</td>
<td>59.6%</td>
<td>41.7%</td>
<td>18.2%</td>
<td>5.4%</td>
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<tr>
<td>2012</td>
<td>278</td>
<td>67.9%</td>
<td>56.7%</td>
<td>45.1%</td>
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<td>259</td>
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<td>2014</td>
<td>271</td>
<td>70.5%</td>
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<tr>
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<td>71.8%</td>
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<tr>
<td>2017</td>
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