Assessment of Learning Outcomes & the Concept of Value Added Score

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Distance Education Accrediting Commission

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National center for professional (Higher and VET) education quality assurance
Workshop Overview

I. Why Outcomes Assessment?
II. The Case for and Against
III. Process and Literature
IV. Practical Examples
V. Case Study Presented by Reuben Topchyan
VI. Role of Quality Assurance (accreditation)
VII. Value Added Score
Outcomes-Based Assessment – Why?

- A commitment to being learner centered
- Visible in teaching and learning
- Concerns that the traditional paradigm of large lecture formats sprinkled with an occasional question and answer session is no longer effective
The Case for Outcomes Assessment

The initiate-respond-evaluate cycle:

I’ll ask the question, a few of you will answer for the entire class, and we’ll all pretend this is the same thing as learning.

Fisher and Frey, 2007
The Case for Outcomes Assessment

The more you teach without finding out who understands the concepts and who doesn’t, the greater the likelihood that only already-proficient students will succeed.

Grant Wiggins, 2006
The worst scenario is one in which some pupils who get low marks this time also got low marks last time and come to expect to get low marks next time.

This cycle of repeated failure becomes part of a shared belief between such students and their teacher.

Black and Wiliam, 1998
Concerns and Objections

“It’s inflexible, mechanic, and reductionist.”

“It privileges lower-order measurable knowledge and skills.”

“Its unresponsive to multiple intelligences and diverse learning styles.”

“It has a tendency to be highly prescriptive for both learners and educators, inhibiting creativity and flexibility.”

“True education cannot be measured.”
A Culture of Inquiry – the Big Questions

What do we want our university graduates to be able to do and be?

What do we expect our students who major in ____________ to be able to do and be?
Outcomes Assessment Learning Community

1. Identify Outcomes
2. Select and Design Measures
3. Plan for data collection
4. Implement measures - analyze data
5. Use results to improve
The Building Blocks

- Deep Learning
- Cognitive & Affective Domain
- Formative & Summative Assessment
- Learner-centered Assessment
Comparison of Surface Learning and Deep Learning

<table>
<thead>
<tr>
<th>SURFACE LEARNING</th>
<th>DEEP LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrelated bits of knowledge</td>
<td>Relationships</td>
</tr>
<tr>
<td>Memorization, following directions</td>
<td>Patterns, principles, integration</td>
</tr>
<tr>
<td>Difficulty with “making sense”</td>
<td>Logic, evidence, conclusions</td>
</tr>
<tr>
<td>Study without strategy or reflection</td>
<td>Understanding, metacognition</td>
</tr>
<tr>
<td>External motivation</td>
<td>Internal motivation</td>
</tr>
<tr>
<td>Little meaning, tasks</td>
<td>Active interest, engagement</td>
</tr>
</tbody>
</table>

Source: Adapted from *Achieving Deep Learning* by N.J. Entwistle (2000), Chicago, IL
# Levels of the Cognitive Domain

<table>
<thead>
<tr>
<th>LEVELS</th>
<th>LEARNER OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>defines, repeats, lists, names, observes, memorizes, recites, listens, selects,</td>
</tr>
<tr>
<td></td>
<td>draws, fills in, records, asks</td>
</tr>
<tr>
<td>Comprehension</td>
<td>restates, describes, explains, tells, identifies, discusses, reports, estimates,</td>
</tr>
<tr>
<td></td>
<td>paraphrases, documents, defends, generalizes</td>
</tr>
<tr>
<td>Application</td>
<td>Changes, computes, demonstrates, shows, operates, uses, solves, sequences, tests,</td>
</tr>
<tr>
<td></td>
<td>classifies, translates, employs, constructs, interprets, writes</td>
</tr>
<tr>
<td>Analysis</td>
<td>Dissects, distinguishes, differentiates, calculates, texts, contrasts, debates,</td>
</tr>
<tr>
<td></td>
<td>solves, experiments, relates, maps, categorizes, subdivides</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Compares, concludes, contracts, criticizes, justifies, supports, states, appraises,</td>
</tr>
<tr>
<td></td>
<td>discriminates, summarizes, recommends, decides, selects</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Creates, composes, proposes, formulates, sets up, assembles, constructs, manages,</td>
</tr>
<tr>
<td></td>
<td>invents, produces, hypothesizes, plans, designs, creates, organizes</td>
</tr>
</tbody>
</table>

Bloom's Taxonomy: Bloom, Englehart, Furst, Hill and Krathwohl
Levels of the Affective Domain

<table>
<thead>
<tr>
<th>From the simple to the complex:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Receiving</strong> requires learners to attend – to listen, notice, observe</td>
</tr>
<tr>
<td><strong>Responding</strong> asks learners to discuss, argue, agree/disagree in response to what is heard or observed</td>
</tr>
<tr>
<td><strong>Valuing</strong> requires learners to consider what was received, to use it to make decisions about its importance, to regard it as priority and place a value on it</td>
</tr>
<tr>
<td><strong>Organizing</strong> requires learners to place values in relationship to other values, to organize judgements and choices, and to be influenced by the value</td>
</tr>
<tr>
<td><strong>Characterizing</strong>, the highest level, requires learners to organize their values to the point that they are internalized or become part of the learners’ lives</td>
</tr>
</tbody>
</table>

Krathwohl's Taxonomy of Affective Domain
Levels of the Psychomotor Domain

<table>
<thead>
<tr>
<th>Imitation</th>
<th>Manipulation</th>
<th>Precision</th>
<th>Articulation</th>
<th>Naturalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observing and copying another's</td>
<td>Reproducing action/skill through</td>
<td>Accurately executing action/skill</td>
<td>Integrating multiple actions/skills</td>
<td>Naturally and automatically performing</td>
</tr>
<tr>
<td>action/skill</td>
<td>instruction</td>
<td>on own</td>
<td>and performing consistently</td>
<td>actions/skills at high level</td>
</tr>
<tr>
<td>Adhere</td>
<td>Build</td>
<td>Calibrate</td>
<td>Adapt</td>
<td>Design</td>
</tr>
<tr>
<td>Copy</td>
<td>Execute</td>
<td>Complete</td>
<td>Combine</td>
<td>Invent</td>
</tr>
<tr>
<td>Follow</td>
<td>Implement</td>
<td>Control</td>
<td>Construct</td>
<td>Manage</td>
</tr>
<tr>
<td>Repeat</td>
<td>Perform</td>
<td>Demonstrate</td>
<td>Coordinate</td>
<td>Project</td>
</tr>
<tr>
<td>Replicate</td>
<td>Recreate</td>
<td>Perfect</td>
<td>Develop</td>
<td>Specify</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Show</td>
<td>Formulate</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Integrate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Master</td>
<td></td>
</tr>
<tr>
<td>Ravidra Dave’s Psychomotor Domain</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>
Formative and Summative Assessment

*Formative* – ongoing assessment that provides information about progress, misunderstanding, need for clarification

*Summative* – a final process that follows the sequence of teaching and learning, providing students with an opportunity to summarize what they have learned and integrate it with new ideas or experiences.
Using Learning Outcomes as a Centerpiece

Learning outcomes are the centerpiece at all levels – the course, the program, the degree

But, they do not stand alone

Evidence, criteria and standards together with outcomes build the curriculum.
**Outcomes, Evidence, Criteria, Standards**

<table>
<thead>
<tr>
<th>OUTCOME:</th>
<th>Students articulate an individual code of ethics and apply it to personal decisions of integrity.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVIDENCE:</td>
<td>• Written personal code with discussion of two different decisions of integrity&lt;br&gt;• Multimedia presentation on personal code&lt;br&gt;• Letter of application for employment responding to questions of ethics</td>
</tr>
<tr>
<td>CRITERIA:</td>
<td>Reflection – Multiple Perspectives – In-depth analysis</td>
</tr>
<tr>
<td>STANDARDS:</td>
<td>FOR Reflection</td>
</tr>
</tbody>
</table>

**Excellent** – the student consistently raises questions, analyses assumptions, connects with previous experiences, elaborates on implications for future actions.  
**Satisfactory** – the student raises questions, begins to connect with previous experiences and occasionally assess decisions, identifies assumptions.  
**Unsatisfactory** – the student moves through the decision-making process with few questions and unaware of the influence of assumptions.
What are your evidence, criteria and standards?

Overarching question for students taking a general education course on Museum Studies:

How do museums give voice to underrepresented populations and perspectives and facilitate the transformation of social structures to create a more inclusive, interactive discussion of history, society and culture?

Develop evidence, criteria, and standards for these student learning outcomes:

1. Identify and analyze how museums serve and reflect multiple communities in terms of representation and relevance.

2. Analyze and articulate the internal and external economic and social pressures that influence the choices made by museum personnel, boards and volunteers with regard to the development of collections and exhibits.
Assessment of Learning Outcomes in Practice

Region A Community College – Discipline Assessment Cycle

The Discipline Assessment Cycle (DAC) pulls together information at the course- and program-level, together with data regarding general education, departmental snapshots, and relevant skills. The framework of the DAC is designed to promote meaningful assessment, while simultaneously providing a source of assessment information from across the institution. The data gathered is then forwarded to other processes and bodies within the college where such information is needed, such as Master Planning, Budget Development, and committees and councils, such as the Academic and Campus Affairs Council. It also serves to provide documentation to outside accrediting bodies.

Discipline = areas of study (e.g., psychology, information technology, accounting)
The Assessment Cycle

- identifying Program-Level Student Learning Outcomes, General Education Competencies, and Course-Level Student Learning Outcomes;
- measuring these outcomes;
- analyzing the results of the measures;
- creating an action plan for improvement;
- implementing this action plan; and
- “closing the loop” by assessing and evaluating the results of the action plan.
Program Level Student Learning Outcome

**Definition:**

A Program-Level Student Learning Outcome (PSLO):

- is a statement defining the knowledge or skills that students are expected to possess upon the successful completion of an award;
- must be measurable and meaningful so data can be gathered on the extent to which a student has achieved the PSLOs;
- reflects the culmination of what students learn across the degree’s required courses, rather than what students learn in one specific course; and
- is introduced in one course and further reinforced and developed in later courses.
Award: AAS and Certificate in Child Development

Program-Level Student Learning Outcomes

Upon completion of the AAS in Child Development students will be able to:

1. **use developmental knowledge to create healthy, respectful, supportive, and challenging learning environments;**
   
<table>
<thead>
<tr>
<th>CDEC 1303</th>
<th>CDEC 1311</th>
<th>CDEC 1392</th>
<th>CDEC 1413</th>
<th>CDEC 1419</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</table>

1. **observe, document, and assess to support young children and their families;**
   
<table>
<thead>
<tr>
<th>CDEC 1303</th>
<th>CDEC 1311</th>
<th>CDEC 1392</th>
<th>CDEC 1413</th>
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<td>X</td>
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<td>X</td>
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</tbody>
</table>

1. **build family and community relationships;**
   
<table>
<thead>
<tr>
<th>CDEC 1303</th>
<th>CDEC 1311</th>
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<th>CDEC 1413</th>
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<tbody>
<tr>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</table>

1. **design, implement, and evaluate meaningful, challenging curriculum to promote positive outcomes; and**
   
<table>
<thead>
<tr>
<th>CDEC 1303</th>
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<th>CDEC 1413</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

1. **discuss and uphold ethical standards and other professional guidelines.**
   
<table>
<thead>
<tr>
<th>CDEC 1303</th>
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<tr>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Upon completion of the AAS or Certificate in Child Development, students will be able to observe, document, and assess to support young children and their families.

Students are assigned to complete a child study that includes a child assessment based on observations. As part of the child assessment, students will develop curriculum tailored to the child’s developmental needs. Upon completion of the child study, the students present their findings to the class simulating a parent conference.

All faculty (fulltime and adjunct) will use a rubric to determine students’ achievement levels.

Who will be responsible for collecting the data?
All faculty members teaching CDEC 1392.

When will the data be collected?
End of Fall 2011 semester.

In which course(s) will the data be collected?
In CDEC 1392.

What is the individual student level of achievement you hope to reach?
Students will meet or exceed expectations in all categories on the rubric.

What is the program target level of achievement you hope to reach?
80% of students will meet or exceed expectations as outlined on rubric.

How will departmental faculty be engaged in analyzing this data?
Faculty members record the rubric outcomes on a summative form and send the completed forms to the Department’s Data Coordinator. The Department Data Coordinator averages the scores and compares them to the target level of achievement.

Who will be coordinating the assessment project?
The Department Data Coordinator.
**Award (Programs):** AAS and Certificate in Child Development

**Program-Level Student Learning Outcome Assessed:** Upon completion of the AAS or Certificate in Child Development, students will be able to observe, document, and assess to support young children and their families.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>How was the action strategy implemented?</td>
<td>Faculty met and discussed the previous semester’s assessment and disappointing results. The decision was made to add an additional child observation exercise in each of the two prerequisite courses. Those courses’ curricula were altered accordingly.</td>
</tr>
</tbody>
</table>
| Please describe any changes in student success that have emerged since the action strategy was implemented. | When CDEC 1392 was assessed this following year, the results indicated a significant improvement of student achievement of the PSLO. 48 students completed the child assessment. Of these 48 students:  
  - 22 (46%) exceeded expectations  
  - 15 (31%) met expectations  
  - 8 (17%) approached expectations  
  - 3 (6%) were below expectations |
<p>| What conclusions did the faculty reach based on their discussion of the implementation and progress on the action strategy? | The action strategy was successful |
| Will the action strategy be revised? If so, please describe how.          | No |</p>
<table>
<thead>
<tr>
<th>General Education Competencies</th>
<th>Core Curriculum Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon completion of the general education component of an associate's degree, students will demonstrate competence in:</td>
<td>PHYS 1401</td>
</tr>
<tr>
<td>1. Analyzing and critiquing competing perspectives in a democratic society. (Civic Awareness)</td>
<td></td>
</tr>
<tr>
<td>1. Gathering, analyzing, synthesizing, evaluating and applying information. (Critical Thinking)</td>
<td>X</td>
</tr>
<tr>
<td>1. Comparing, contrasting, and interpreting differences and commonalities among peoples, ideas, aesthetic traditions, and cultural practices. (Cultural Awareness)</td>
<td></td>
</tr>
<tr>
<td>1. Identifying and applying ethical principles and practices. (Ethical Reasoning)</td>
<td></td>
</tr>
<tr>
<td>1. Interacting collaboratively to achieve common goals. (Interpersonal Skills)</td>
<td>X</td>
</tr>
<tr>
<td>1. Demonstrating effective learning, creative thinking, and personal responsibility. (Life/Personal Skills)</td>
<td></td>
</tr>
<tr>
<td>1. Applying mathematical, logical and scientific principles and methods. (Quantitative and Empirical Reasoning)</td>
<td>X</td>
</tr>
<tr>
<td>1. Using appropriate technology to retrieve, manage, analyze, and present information. (Technology Skills)</td>
<td>X</td>
</tr>
<tr>
<td>1. Communicating effectively, adapting to purpose, structure, audience, and medium. (Written, Oral and Visual Communication)</td>
<td>X</td>
</tr>
</tbody>
</table>
Webbing Learning Outcomes for Connectedness

LO 1: Plan, Design and Produce an Interactive Media Project

LO 2: Principles of Graphic Design

LO 3: Basic Scripting Techniques

LO 4: Principles of User-Centered Design

LO 5: Plan, Design and Implement Usability Testing

LO 6: Demonstrate Collaborative Teamwork

LO 7: Peer Review and Design Critiques
Rethinking “employer – academy” conversation

3D geometry of alignment

Triangulation

Dr. Ruben Topchyan, ANQA, Armenia
Alignment channels - 2D

- Course LO
- Instruction
- Assessment & Feedback
Alignment channels - 3D

Program LO

Course LO

Assessment & Feedback

Instruction
Alignment channels - 3D

Program LO

Course LO

Assessment & Feedback

Instruction
Alignment channels - 3D

Program LO

Course LO

Assessment & Feedback

Instruction
Alignment channels - 3D - triangulation
Alignment channels - 3D - triangulation
Alignment channels - 3D - Inheritance

Program LO

Course LO

Teaching & Learning

Assessment & Feedback

Instruction

Program LO
Alignment channels - 3D inheritance & completeness

Program LO

1

2

3

4

Assessment & Feedback

Course LO

Employer context

Instruction
What we observe is eternal tandem: employers – students - HEI

Couldn’t you come up with useable skills? So sad, total losers!

EMPLOYERS  

STUDENTS  

ACADEMY
How employers are engaged in academic program development?

1. General feedback on curricula
2. Opinion on formulation of pLO
3. Opinion on formulation of cLO

The result is always insufficient and fragmented.

Lack of practical skills among students 🙃
No common language

There is divergence between concepts used by both sides

<table>
<thead>
<tr>
<th>ACADEMY</th>
<th>EMPLOYER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning outcomes</td>
<td>Product</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Product lifecycle</td>
</tr>
<tr>
<td>Skills</td>
<td>Professional thinking</td>
</tr>
<tr>
<td>Competences</td>
<td></td>
</tr>
</tbody>
</table>

As a result, employers’ context is not always transferred to academy
How to transfer employers context to academy?

Why assessment?
- Can directly address to practice
- Understandable for Academy
- Results Could be evaluated

Why teaching and learning?
- To shape the environment of education

Employer
- Product
- Professional thinking
- Product Lifecycle

Academy
- Learning Outcomes
- Teaching

Assessment context
Piloting the framework

1. Sample
   a) Key IT employers including umbrella organization

2. Focus groups were held both with
   a) High level management (CEO)
   b) Middle level management (CTO)
   c) Staff (3 years experience and freshman)

3. Companies has been differed in terms of size and profile in IT

4. Main points of discussions
   a) Products and requirements
   b) Professional thinking Skills (skills for decision and thinking) and competencies
   c) Life cycle organization competencies for product development
Finding of graduates weaknesses

Products
  ◦ Open source software adaptation
  ◦ Online Personalization of purchase

Computer thinking
  ◦ Algorithmic thinking
  ◦ Complexity of algorithms
  ◦ Data structure selection and development

Product Life Cycle
  ◦ Looking for appropriate Open Source
  ◦ Localization of adapting modules change
  ◦ Interface and body development
  ◦ Isolated testing
  ◦ Testing after the embedding
Alignment channels - 3D model

- Course LO
- Instruction
- Assessment & Feedback

Employer context
Alignment channels - 3D model

Employer context

Course LO

1

Teaching & Learning

Assessment & Feedback

Instruction

2

Employer context
## Alignment plan

<table>
<thead>
<tr>
<th>• Assessment</th>
<th>• Employer context</th>
<th>• Course LO</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Module testing skills</td>
<td>• Open source software module</td>
<td>• Sorting algorithms</td>
</tr>
<tr>
<td>training &amp; assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Assessment</td>
<td>• Employer context</td>
<td>• Instruction</td>
</tr>
<tr>
<td>• Testing skills training/assessment</td>
<td>• Open source software module</td>
<td>• Modular design principles</td>
</tr>
<tr>
<td>• Instruction</td>
<td>• Employer context</td>
<td>• Course LO</td>
</tr>
<tr>
<td>• Testing skills training/assessment</td>
<td>• Open source software module</td>
<td>• Top down software projecting/development</td>
</tr>
</tbody>
</table>
Completeness of QA communication

**What is the goal of this/specific assessment task**

- Employer requested context of competency
- What was requested by course LO (which one)
- What was taught theoretically for that
Trainings and practice of use

• TEMPUS ALIGN project
  • University of Art
  • Medical university
  • Linguistic university
  • Guideline for Alignment
  • Trainings of teaching staff
• Self Evaluation of 6 programs using tools of alignment
• Review done by EU and local experts

• Trainings for chairs of departments
  • Police academy
  • Military institution
  • University of theater and kino
  • Medical university
Thank you!

ruben.topchyan@anqa.am
Key Questions for Quality Assurance

- Are the outcomes, evidence, criteria and standards clearly disclosed to students?
- Are the outcomes evidence, criteria and standards clear and well understood by faculty?
- Does the academic advising system consistently establish a path for students to achieve the learning outcomes?
- Are resource materials and study guides appropriate to the outcomes, evidence, criteria and standards?
- Is there a tracking system to keep a record of students’ achievement of the outcomes?
Key Areas for Quality Assurance

✓ Evidence of Student Learning
✓ Common Understanding of Outcomes, Criteria and Standards Across the Institution
✓ Connecting Teaching and Assessment Activities to the Learning Outcomes
✓ Making it Inquiry Based
✓ Engaging Faculty and Drawing on Faculty Experience
Institutions should be able to...

Show how they assess student learning at course, program and institutional levels

1) Examine learning culture

2) Design assessment, articulate goals, develop clear outcomes, evidence, criteria and standards

3) Make outcomes, evidence, criteria and standards visible (syllabi, website, literature)

4) Collect evidence of student achievement

5) Review and analyze evidence

6) Revise outcomes and criteria, improve pedagogy and curriculum
Role of Accreditation/Quality Assurance

Whether governmental or non-governmental, there are six key aspects to consider:

1) Student learning outcomes
2) Evidence of student learning
3) At what level should evidence of student learning be sought?
4) To what extent should student learning outcomes be specified by the accreditor?
5) What models are available to accreditors in determining an approach?
6) What issues should be anticipated?
Value Added Score

“Student achievement, which is inextricably connected to institutional success must be measured by institutions on a ‘value-added’ basis that takes into account students’ academic baseline when assessing their results. This information should be made available to students, and reported publicly in aggregate from to provide consumers and policy makers an accessible, understandable way to measure effectiveness of different colleges and universities.”

- Quote from “A Test of Leadership,” the 2006 Report of the Spellings Commission on Higher Education
Value Added Score

Multidimensional features of higher education

No single measure

Limitations of data
Value Added Score

Data, sample and variable construction

Individual level data

Earnings records
thank you