Assessment in Online Courses: Affective Learning Outcomes

IUPUI 2021 Assessment Institute

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Desired Outcomes

1) Recognize the utility of weekly formative assessments in online coursework
2) Differentiate the affective learning domain
3) Question the effects of attitudes and emotions on learning outcomes
4) Weigh the practical considerations of affective learning outcomes assessment

1 ONLINE ASSESSMENT

Be Self Aware

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Be Aware of Students

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Assess Learning Outcomes

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Setting One

Online For-credit Coursework: Formative Assessment

HOW DO WE DO THAT?

01 REACTION
Did they like it?

02 LEARNING
Did they learn it?

03 TRANSFER
Will they use it?

04 RESULTS
Will it matter?

05 ROI
Return on investment
(Simonson et al. pp. 308-309)

WEEKLY FORMATIVE ASSESSMENT

Five levels of Evaluation: Kirkpatrick (1994) and Simonson, et al. (2015)

HOW DO WE DO THAT?

LEVEL – I EVALUATION

01 REACTION

Did they like it?

- The learning activities were effective.
- Instructions were clear and easy to follow.
- I learned something I had not known before this week.
- The learning activities were engaging.
- I struggled with comprehension for this week's learning activities.

WEEKLY FORMATIVE ASSESSMENT

HOW DO WE DO THAT?

LEVEL – II EVALUATION

02 **LEARNING**

Did they learn it?

Reflect on the most interesting or most useful constructs from the course learning activities.

WEEKLY FORMATIVE ASSESSMENT

Setting Two

Massive Online Open Course (MOOC) Assessment

MOOC TIMELINE

2015

Born out of PDF resource creation in 2015-2016

2016

2017

First course was launched in spring 2017 with CSU

2020

Earn PLA credit in NLU EdD program for course badge

Five course sections have run so far – each in winter/spring

MOOC SETTING

Self-paced, eight-module/ eight-week experience

Course materials

Beyond email/discussion interactions, live webinars with instructors occur prior to course launch and in the last week

Lecture videos/text, plus Personal Takes

Assigned readings, plus Further Learning

Eight discussion boards, seven quizzes, two assignments – criteria to earn badge

Optional: small groups by institutional type, sharing of contact information

Results

Formative Assessment: Instructor Performance & Student Learning

Instructor Performance Examples

Level 1 Evaluation disaggregation by cohort

Two doctoral cohorts

Statistics

Variable	Cohort	Mean	StDev	Median	Q3	Range	Mode	N for Mode
Effective Activities	1	3.2377	0.7620	3.0000	4.0000	3.0000	3	189
	2	3.4722	0.6372	4.0000	4.0000	3.0000	4	242

Variable	Cohort	Mean	StDev	Median	Q3	Range	Mode	N for Mode
Clear Instructions	1	3.0466	0.8454	3.0000	4.0000	3.0000	3	170
	2	3.4174	0.7372	4.0000	4.0000	3.0000	4	243

Variable	Cohort	Mean	StDev	Median	Q3	Range	Mode	N for Mode
Learned Something New	1	3.4910	0.6453	4.0000	4.0000	3.0000	4	218
	2	3.5982	0.5863	4.0000	4.0000	3.0000	4	288

Variable	Cohort	Mean	StDev	Median	Q3	Range	Mode	N for Mode
Engaging Activities	1	3.2254	0.7617	3.0000	4.0000	3.0000	3	182
	2	3.4053	0.6785	4.0000	4.0000	3.0000	4	226

Variable	Cohort	Mean	StDev	Median	Q3	Range	Mode	N for Mode
Struggled w/Comprehension	1	2.1602	0.9949	2.0000	3.0000	3.0000	2	124
	2	2.0780	1.0332	2.0000	3.0000	3.0000	1	173

Instructor Performance Significance

Level 1 Evaluation significance test for median values: MMT

Two doctoral cohorts

STRATEGIC_PLANNING_TWO_COHORTS_COMPLETE.MWX

Mood's Median Test: Clear Instructions versus Cohort

Descriptive Statistics

Cohort	Median	N <= Overall Median	N > Overall Median	Q3 – Q1	95% Median CI
1	3	259	127	1	(3, 3)
2	4	205	243	1	(3, 4)
Overall	3				

95.0% CI for median(1) - median(2): (-1,-1)

Test

Null hypothesis H_0: The population medians are all equal

Alternative hypothesis H_1: The population medians are not all equal

DF	Chi-Square	P-Value
1	38.25	0.000

Instructor Performance Significance

Level 1 Evaluation significance test for median values: K-WT

Two doctoral cohorts

STRATEGIC_PLANNING_TWO_COHORTS_COMPLETE.MWX

Kruskal-Wallis Test: Clear Instructions versus Cohort

Descriptive Statistics

Cohort	N	Median	Mean Rank	Z-Value
1	386	3	361.3	-6.26
2	448	4	466.0	6.26
Overall	834		417.5	

Test

Null hypothesis	H_0: All medians are equal
Alternative hypothesis	H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	1	39.16	0.000
Adjusted for ties	1	46.13	0.000

ASSESSING AFFECTIVE LEARNING: Level 2 Evaluation Instrument, Griffith University Affective Learning Scale

Figure 3: GUALS-score rating categories.

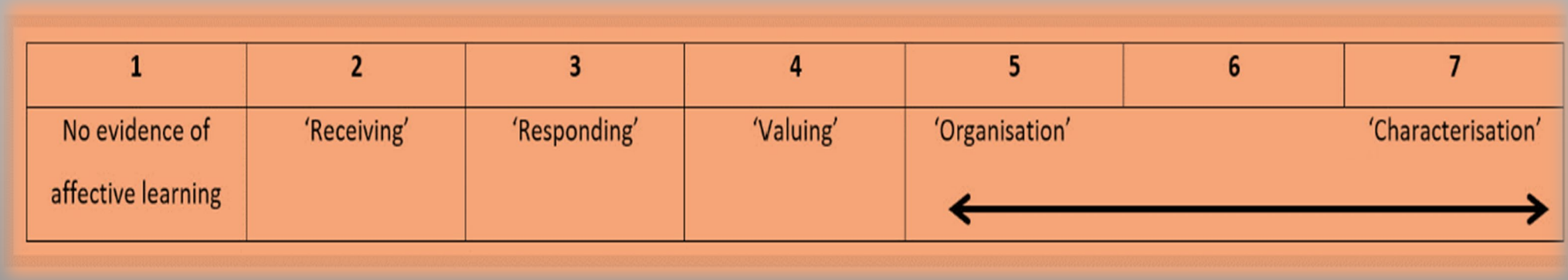


Figure 3 *from:*
Nix, J. V., Shelton, V. K., & Song, L. M. (in press). Implementing affective learning outcomes through a meaning-centered curriculum. In Kapur, E. & Blessinger, P. (Eds.), ICT and innovation in teaching learning methods in higher education. Emerald.

Student Learning Example

Table 6 is from Nix, J. V., Song, L. M.,& Lindbeck, R. L., (forthcoming). *Affective learning outcomes assessment as a path to online dialogic student development*.

Two doctoral cohorts

Table 6.

GUALS-score statistics across both cohorts, by week (learning module).

		Statistics						
Variable	**Week**	**Mean**	**StDev**	**Median**	**Q3**	**Range**	**Mode**	**N for Mode**
GUALS_score	1	3.446	2.004	3.000	5.000	6.000	1	28
	2	3.943	1.925	4.000	5.000	6.000	3	28
	3	3.744	1.429	4.000	5.000	6.000	3	38
	4	4.309	1.913	5.000	6.000	6.000	3	33
	5	4.458	2.127	4.500	7.000	6.000	7	33
	6	4.615	2.035	5.000	7.000	6.000	7	32
	7	4.142	1.798	4.000	5.000	6.000	3, 5	31

Student Learning Example

Disaggregation by Cohort

Two doctoral cohorts

Descriptive Statistics: GUALS_score

Results for Cohort = 1

Statistics

Variable	Week	Mean	StDev	Median	Q3	Range	Mode	N for Mode
GUALS_score	1	3.218	2.052	3.000	5.000	6.000	1	18
	2	3.786	1.856	4.000	5.000	6.000	3	13
	3	3.818	1.156	4.000	5.000	6.000	4	19
	4	5.357	1.600	5.000	7.000	6.000	7	20
	5	5.255	1.974	6.000	7.000	6.000	7	25
	6	5.418	1.707	6.000	7.000	6.000	7	24
	7	4.607	1.371	5.000	5.000	4.000	5	19

Results for Cohort = 2

Statistics

Variable	Week	Mean	StDev	Median	Q3	Range	Mode	N for Mode
GUALS_score	1	3.667	1.949	3.000	5.000	6.000	3	13
	2	4.076	1.987	5.000	5.250	6.000	5	18
	3	3.682	1.628	3.000	5.000	6.000	3	21
	4	3.433	1.708	3.000	5.000	6.000	3	25
	5	3.762	2.022	4.000	6.000	6.000	1, 3	11
	6	3.955	2.056	4.000	6.000	6.000	5	15
	7	3.734	2.026	3.000	5.750	6.000	3	16

Instructor Performance vs Student Learning

Level 2 Evaluation data significance test for median values: K-WT

Two doctoral cohorts

STRATEGIC_PLANNING_TWO_COHORTS_COMPLETE.MWX

Kruskal-Wallis Test: GUALS_score versus Clear Instructions

Descriptive Statistics

Clear Instructions	N	Median	Mean Rank	Z-Value
*	2	4	413.0	-0.03
1-Completely Disagree	31	3	296.9	-2.86
2-Moderately Disagree	103	3	306.0	-5.05
3-Moderately Agree	330	4	394.9	-2.28
4-Completely Agree	370	5	481.1	6.68
Overall	836		418.5	

Test

Null hypothesis	H_0: All medians are equal
Alternative hypothesis	H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	58.22	0.000
Adjusted for ties	4	59.95	0.000

The chi-square approximation may not be accurate when some sample sizes are less than 5.

Emotional Effect on Affective Learning

Level 2 Evaluation data significance test for median values: K-WT

Two doctoral cohorts

Kruskal-Wallis Test: GUALS_score by Primary Emotion

Descriptive Statistics

Primary emotion	N	Median	Mean Rank	Z-Value
AN	5	3.0	280.6	-1.29
ANW	90	3.0	344.6	-3.11
AP	30	1.0	65.5	-8.16
AW	167	3.0	250.4	-10.09
CF	*36*	*3.0*	*229.2*	*-4.82*
CN	359	6.0	602.2	18.91
H	12	4.0	387.9	-0.46
J	19	5.0	445.1	0.47
S	109	3.0	327.0	-4.28
Overall	838		419.5	

Test

Null hypothesis	H_0: All medians are equal
Alternative hypothesis	H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	11	408.41	0.000
Adjusted for ties	11	420.50	0.000

Attitudinal Effect on Affective Learning

Level 2 Evaluation data significance test for median values: K-WT

Two doctoral cohorts

Kruskal-Wallis Test: GUALS_score by Attitude

Descriptive Statistics

Attitude	N	Median	Mean Rank	Z-Value
E	222	3	225.0	-13.96
K	412	5	529.2	12.90
U	73	2	242.7	-6.53
V	131	5	502.6	4.28
Overall	838		419.5	

Test

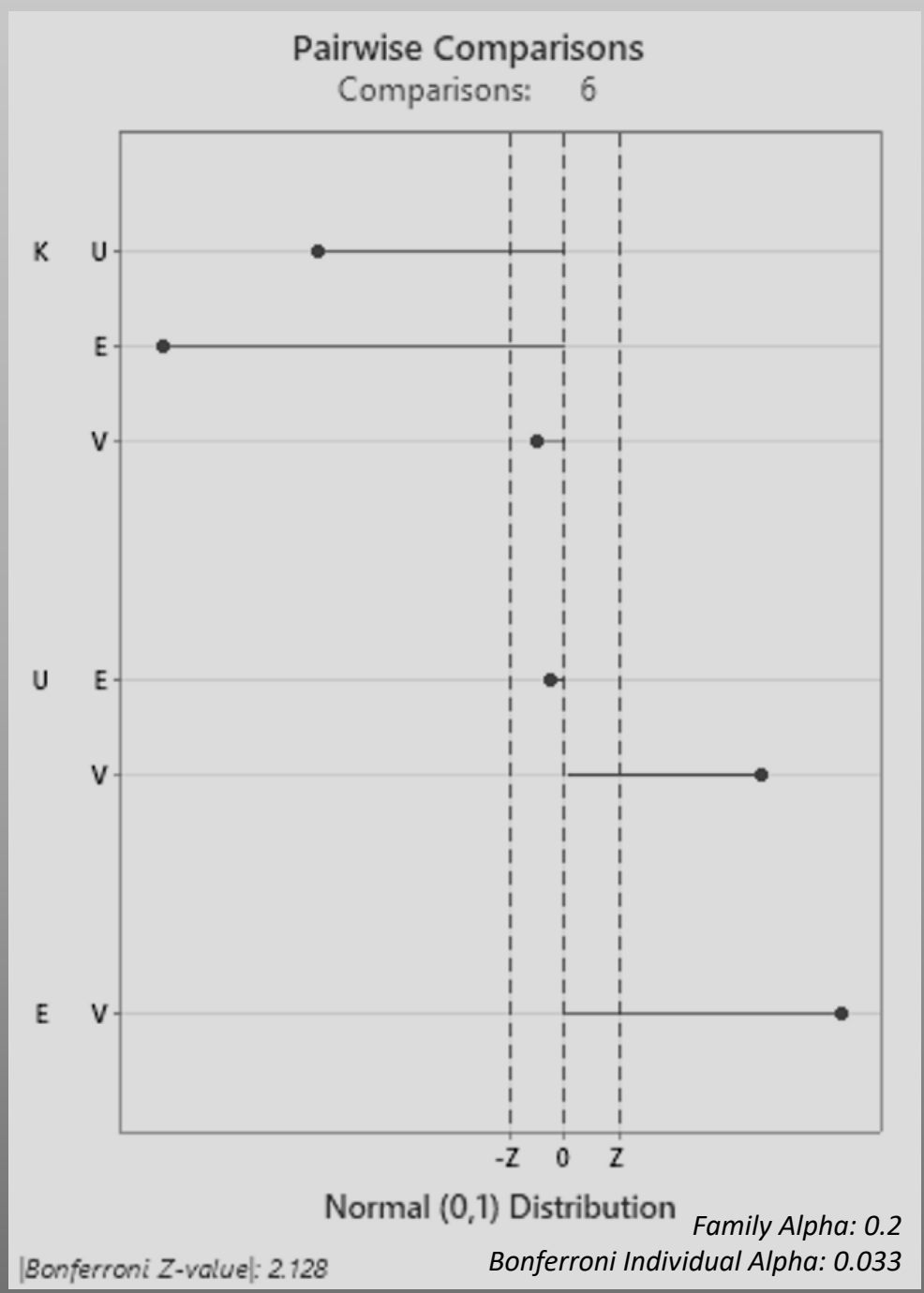
Null hypothesis	H_0: All medians are equal
Alternative hypothesis	H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	3	282.30	0.000
Adjusted for ties	3	290.66	0.000

Post-hoc Mann-Whitney U for significant Kruskal-Wallis results

Level 2 Evaluation data post-hoc Mann-Whitney U test for significant interaction main effect

Two doctoral cohorts



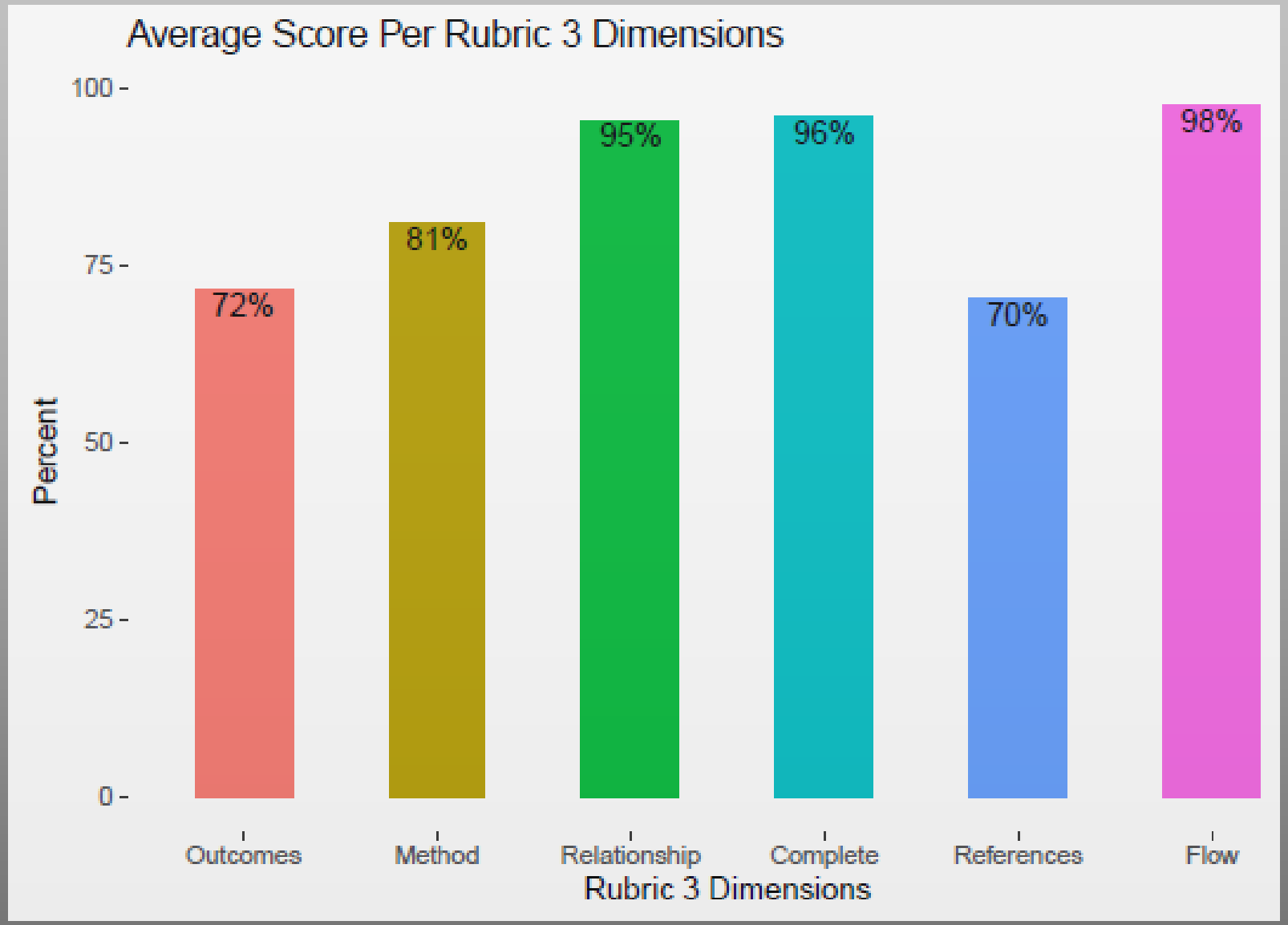
Results

MOOC Analyses

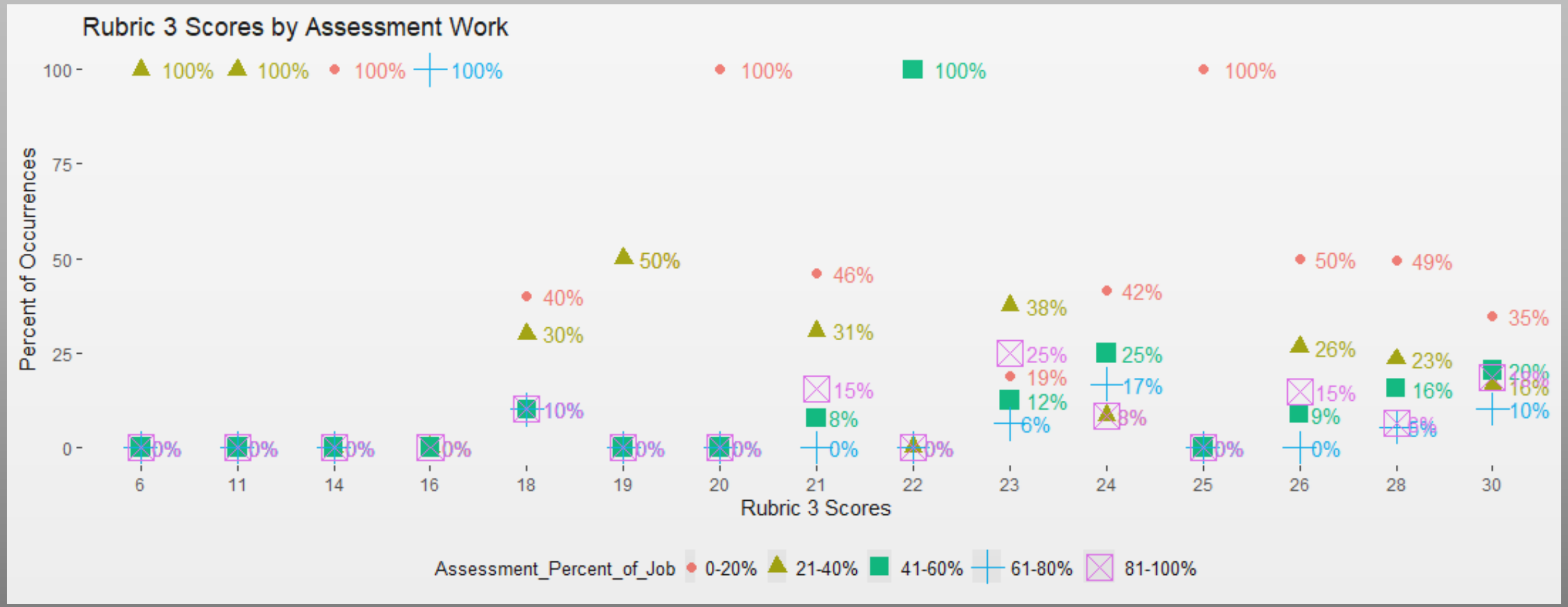
Rubric 3 Data

	total_paper_grade	Outcomes	Method	Relationship	Complete	References	Flow
nbr.val	280.00	280.00	280.000	280.000	280.000	280.000	280.000
nbr.null	4.00	53.00	30.000	10.000	7.000	10.000	4.000
nbr.na	0.00	0.00	0.000	0.000	0.000	0.000	0.000
min	0.00	0.00	0.000	0.000	0.000	0.000	0.000
max	30.00	5.00	5.000	5.000	5.000	5.000	5.000
range	30.00	5.00	5.000	5.000	5.000	5.000	5.000
median	28.00	5.00	5.000	5.000	5.000	3.000	5.000
mean	25.59	3.58	4.050	4.771	4.804	3.514	4.879
SE.mean	0.31	0.11	0.097	0.058	0.051	0.068	0.040
CI.mean	0.61	0.23	0.190	0.114	0.101	0.134	0.078
var	27.08	3.67	2.614	0.944	0.732	1.304	0.444
std.dev	5.20	1.92	1.617	0.972	0.856	1.142	0.666
coef.var	0.20	0.54	0.399	0.204	0.178	0.325	0.137

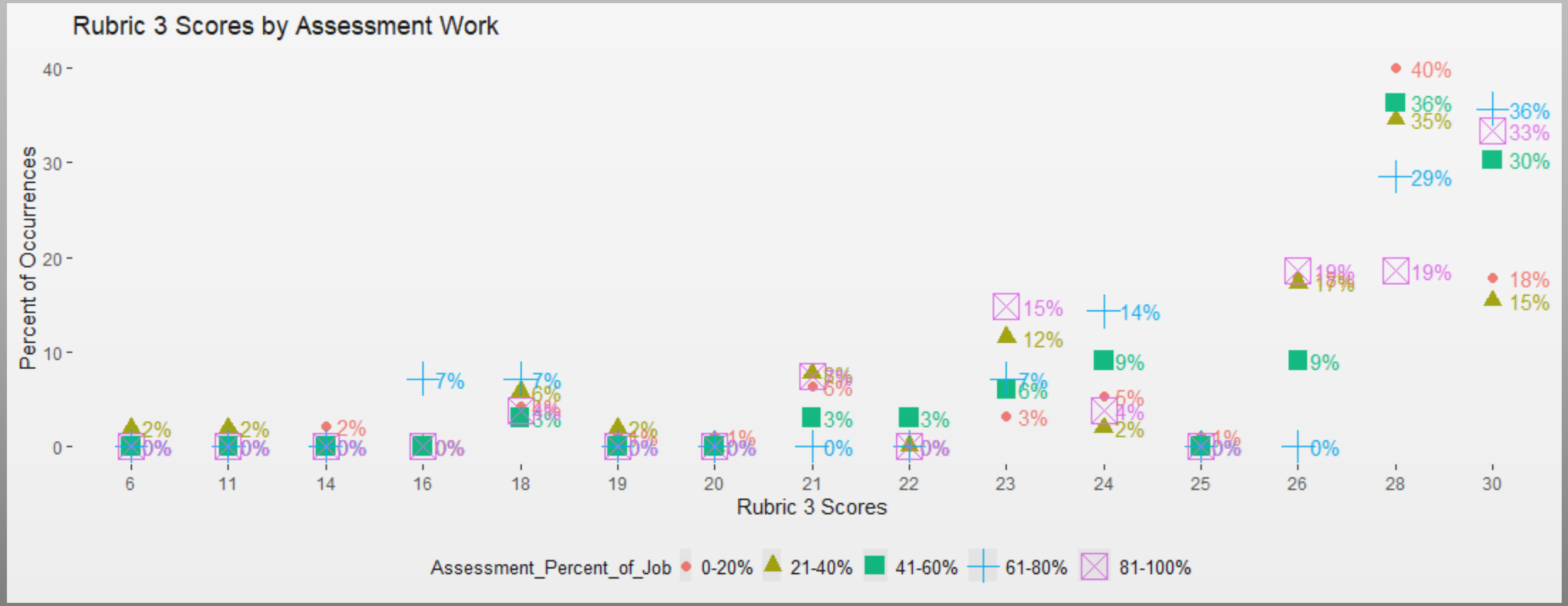
Rubric 3 Data (cont.)



Scores by Work in Assessment



Work in Assessment by Scores



Discussion/Q&A

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Appendix
The Affective Learning Domain

Figure 2.
The Affective Learning Domain.

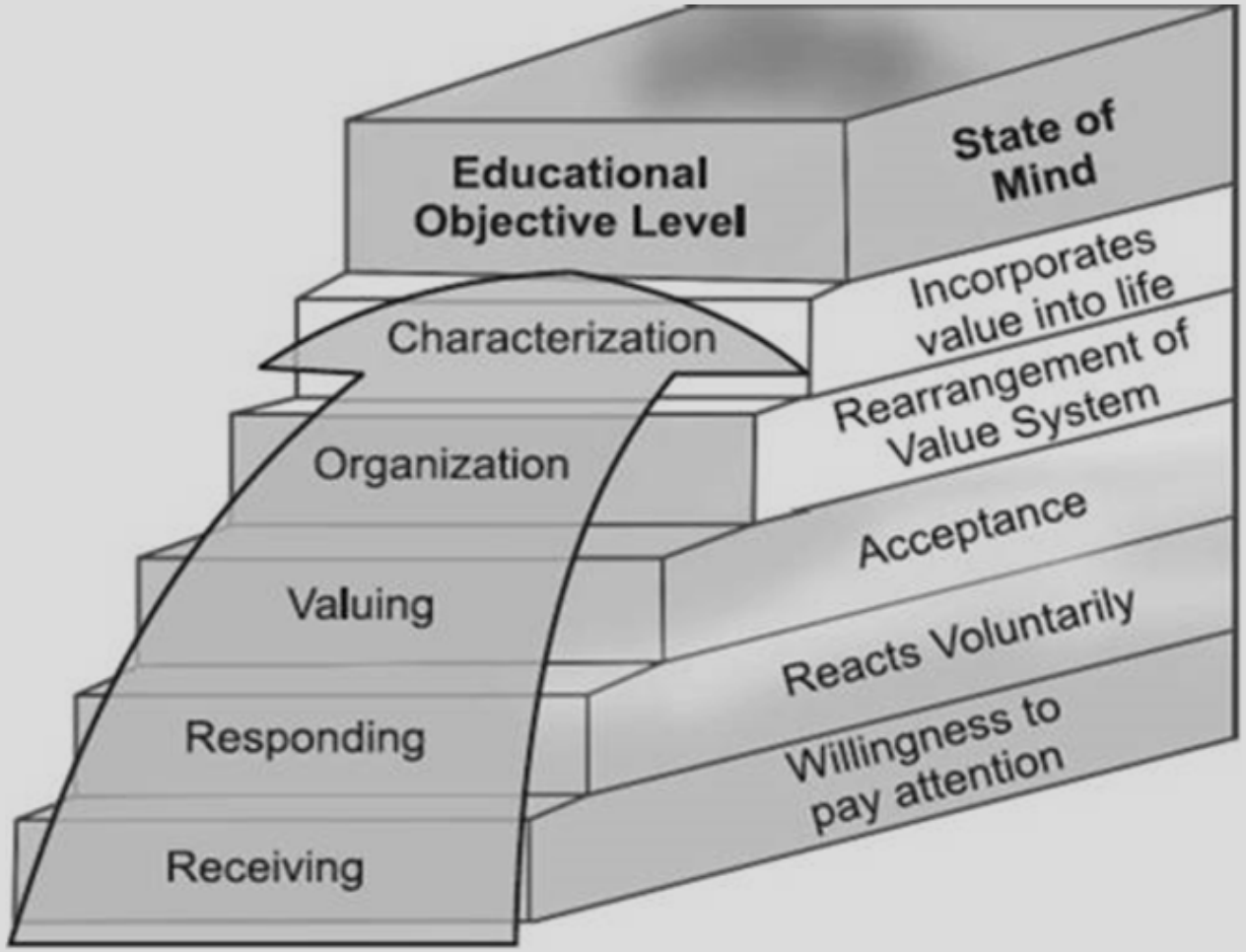

Image from open-source textbook at
https://ebrary.net/2967/management/basic_levels_learning_domains_learning

Figure 2 *from:*
Nix, J. V., Song, L. M., & Lindbeck, R. (2021). Affective learning outcomes assessment as a path to online dialogic student development. *Journal of Organizational Psychology, 21*(4).