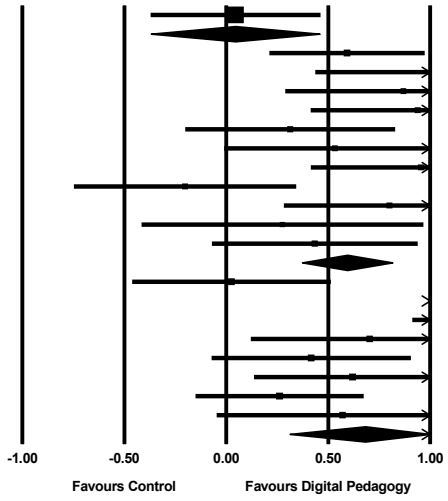
Group by Critical Thinking Assessment Type	Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Original Assessments	Shang et al. (2025)	0.046	0.211	0.045	-0.368	0.460	0.218	0.827
Original Assessments		0.046	0.211	0.045	-0.368	0.460	0.218	0.827
Standardized Assessments	Yang & Wu (2012)	0.593	0.193	0.037	0.215	0.971	3.078	0.002
Standardized Assessments	Ebadi & Rahimi (2018)	1.346	0.462	0.213	0.440	2.251	2.913	0.004
Standardized Assessments	Hsu & Liang (2021)	0.870	0.294	0.086	0.293	1.446	2.957	0.003
Standardized Assessments	Algouzi et al. (2023)	0.940	0.266	0.071	0.417	1.462	3.527	0.000
Standardized Assessments	Jiang et al. (2024)_a	0.314	0.261	0.068	-0.198	0.826	1.203	0.229
Standardized Assessments	Jiang et al. (2024)_b	0.533	0.276	0.076	-0.007	1.074	1.935	0.053
Standardized Assessments	Jiang et al. (2024)_c	0.955	0.274	0.075	0.418	1.492	3.488	0.000
Standardized Assessments	Chang et al. (2024)	-0.202	0.277	0.077	-0.744	0.340	-0.729	0.466
Standardized Assessments	Yin et al. (2024)	0.801	0.263	0.069	0.286	1.316	3.049	0.002
Standardized Assessments	Alpat & Gorgulu (2024)	0.276	0.351	0.123	-0.412	0.964	0.786	0.432
Standardized Assessments	Sendag et al. (2024)	0.435	0.256	0.065	-0.067	0.936	1.699	0.089
Standardized Assessments		0.595	0.113	0.013	0.374	0.816	5.274	0.000
Validated Assessments	Goda et al. (2014)	0.026	0.247	0.061	-0.458	0.510	0.105	0.916
Validated Assessments	Etemadfar et al. (2020)	1.702	0.357	0.128	1.002	2.402	4.763	0.000
Validated Assessments	Mohammadi et al. (2022)	1.342	0.218	0.047	0.916	1.769	6.168	0.000
Validated Assessments	Darmawansah et al. (2022)	0.704	0.296	0.087	0.124	1.283	2.379	0.017
Validated Assessments	Liu et al. (2023)	0.417	0.248	0.061	-0.069	0.903	1.682	0.093
Validated Assessments	Darmawansah et al. (2025)	0.620	0.245	0.060	0.139	1.101	2.527	0.012
Validated Assessments	Liu & Wang (2024)	0.262	0.209	0.044	-0.147	0.671	1.255	0.210
Validated Assessments	Zhang et al. (2025)	0.571	0.314	0.098	-0.044	1.186	1.820	0.069
Validated Assessments		0.683	0.189	0.036	0.313	1.053	3.620	0.000



Meta Analysis