Table S1. Complete EdTech–TPACK Feature Matrix (80 Educational Applications)

Values represent normalized TPACK dimension scores (0–1) derived through rule-based feature engineering from Google Play metadata. See Section 3.4.1 for operationalization details.

No.	Application Title	TK	CK	PK	TPK	TCK	PCK
1	BYJU'S – The Learning App	0.572	0.578	0.831	0.639	0.575	0.704
2	Duolingo: language lessons	0.583	0.504	0.907	0.83	0.543	0.705
3	IIT JEE, NEET, NCERT Solutions	0.402	0.236	0.794	0.542	0.319	0.515
4	Unacademy Learner App	0.582	0.779	0.729	0.591	0.681	0.754
5	Noon Academy – Student Learning App	0.437	0.689	0.726	0.542	0.563	0.708
6	Cambly - English Teacher	0.491	0.593	0.727	0.587	0.542	0.66
7	Edmodo	0.412	0.512	0.708	0.615	0.462	0.61
8	Quizlet: Languages & Vocab	0.583	0.842	0.781	0.726	0.713	0.812
9	Udemy - Online Courses	0.447	0.494	0.788	0.649	0.47	0.641
10	Teachmint - The Classroom App	0.428	0.489	0.709	0.461	0.458	0.599
11	Memrise Easy Language Learning	0.471	0.478	0.819	0.708	0.474	0.648
12	Sololearn: Learn to Code	0.418	0.338	0.772	0.644	0.378	0.555
13	Epic: Kids' Books & Reading	0.681	0.43	0.731	0.724	0.555	0.58
14	LinkedIn Learning: Online Courses to Learn Skills	0.423	0.548	0.766	0.583	0.485	0.657
15	Cuemath: Math Games, Online Classes & Learning App	0.442	0.52	0.668	0.514	0.481	0.594
16	Computer Course	0.31	0.72	0.553	0.368	0.515	0.637
17	Think and Learn | Parent Connect	0.324	0.792	0.543	0.334	0.558	0.668
18	Great Learning- Online Courses	0.44	0.527	0.646	0.461	0.483	0.586
19	uLesson Educational App	0.458	0.476	0.646	0.472	0.467	0.561
20	Pluralsight – The Technology Skills Platform	0.582	0.581	0.681	0.611	0.581	0.631
21	upGrad - Online Learning Courses	0.569	0.861	0.669	0.484	0.715	0.765
22	Skillshare - Creative Classes	0.411	0.4	0.705	0.582	0.405	0.552
23	Cursa - Online courses	0.414	0.44	0.68	0.504	0.427	0.56
24	MasterClass: Learn from the best	0.418	0.695	0.676	0.571	0.557	0.685
25	HSK Study and Exam — SuperTest	0.412	0.38	0.714	0.52	0.396	0.547
26	Taleemabad: Learning at Home	0.532	0.852	0.617	0.453	0.692	0.735
27	10 Minute School - Online Learning Courses	0.562	1	0.683	0.561	0.781	0.841
28	Shaw Academy - Online Courses With Certification	0.401	0.796	0.646	0.551	0.599	0.721
29	HOMER Learn & Grow	0.427	0.657	0.58	0.517	0.542	0.619
30	Chegg Study - Homework Help	0.488	0.488	0.633	0.596	0.488	0.561
31	EduRev Exam Preparation App: Learning & Mock Tests	0.422	0.178	0.722	0.462	0.3	0.45
32	Course Hero: Homework Helper	0.454	0.41	0.657	0.567	0.432	0.534
33	Class 9 Math Science NCERT App	0.402	0.485	0.697	0.418	0.443	0.591
34	Learn Computer Course- offline	0.36	0.737	0.597	0.431	0.548	0.667
35	Wondrium - Learning & Courses	0.608	0.882	0.514	0.55	0.745	0.698
36	LearnVern Online Courses	0.426	0.411	0.677	0.441	0.419	0.544
37	Praadis Education Learning App	0.579	0.549	0.673	0.466	0.564	0.611

38	Classroom	0.502	0.477	0.615	0.413	0.49	0.546
39	E-Learning Platform	0.269	0.604	0	0.09	0.436	0.302
40	Edukoya - Learning App (beta)	0.472	0.807	0.525	0.377	0.639	0.666
41	Administration course	0.318	0.808	0	0.106	0.563	0.404
42	English Basic - ESL Course	0.283	0.342	0.502	0.364	0.312	0.422
43	ReSkills	0.744	0.785	0	0.248	0.764	0.392
44	Learn SEO, SMO, PPC and Digital Marketing course	0.393	0.527	0.513	0.384	0.46	0.52
45	CBSE Class 1 App: NCERT Solutions & Book Questions	0.4	0.541	0	0.133	0.47	0.27
46	CBSE Class 4 App: NCERT Solutions & Book Questions	0.402	0.625	0	0.134	0.513	0.312
47	CBSE Class 5 App: NCERT Solutions & Book Questions	0.4	0.387	0	0.133	0.393	0.194
48	Online Courses + Certificate	0.302	0.754	0.394	0.294	0.528	0.574
49	Crash Course	0.403	0.349	0.605	0.469	0.376	0.477
50	Nutrition Course	0.286	0.653	0	0.095	0.469	0.326
51	Learn Computer Course Offline Free	0.347	0.782	0.431	0.294	0.565	0.606
52	Lurningo - Education App	0.522	0.794	0	0.174	0.658	0.397
53	Smaterr Learning App	0.409	0.415	0.466	0.366	0.412	0.441
54	Converge Study Abroad	0.48	0.79	0.567	0.407	0.635	0.679
55	Cerego	0.402	0.433	0.502	0.411	0.418	0.467
56	Roducate - Great Learning App	0.356	0.821	0.464	0.325	0.588	0.643
57	ROOTs Edu	0.566	0.244	0.55	0.452	0.405	0.397
58	Emerging Study - Learn Online	0.488	0.902	0.549	0.395	0.695	0.726
59	Saylor Academy	0.324	0.512	0.499	0.329	0.418	0.505
60	WiseeClass	0.653	0.457	0	0.218	0.555	0.228
61	Ghoori Learning-Online Courses	0.377	0.912	0.502	0.345	0.645	0.707
62	mKiddo — Kids Learning App	0.408	0.427	0	0.136	0.417	0.213
63	Course with certificate online	0.358	0.741	0.469	0.342	0.549	0.605
64	TeacherTube Educational Videos	0.167	0.909	0.327	0.237	0.538	0.618
65	BacBon School	0.444	0.959	0.534	0.361	0.701	0.746
66	Richmond Learning Platform	0.445	0.338	0	0.148	0.391	0.169
67	ABC Academy BD	0.401	0.515	0.52	0.342	0.458	0.518
68	Learn Smart Classroom	0.35	0.599	0	0.117	0.474	0.3
69	Teams By Lurningo	0.521	0.694	0.352	0.318	0.607	0.523
70	Lectera — online education, online courses	0.38	0.884	0	0.127	0.632	0.442
71	WinjiGo StudentKit	0.399	0.422	0	0.133	0.411	0.211
72	Courstube: Courses to learn	0.384	0.39	0.475	0.335	0.387	0.433
73	Prottoy - Visual Learning App	0.436	0.618	0	0.145	0.527	0.309
74	Digital Coach - IBA DU	0.429	0.641	0.52	0.372	0.535	0.581
75	EdTech Worx	0.315	0.718	0	0.105	0.517	0.359
76	Free Online Courses	0.315	0.905	0	0.105	0.61	0.453
77	Dr course (student)	0.477	0	0	0.159	0.238	0
78	Edutechs	0.472	0.388	0	0.157	0.43	0.194
79	Bluelogic EdTech ERP	0.37	0.605	0	0.123	0.488	0.303

80	EdTech	0.387	0.645	0	0.129	0.516	0.322
81	EdTech Middle East	0.29	0.713	0	0.097	0.501	0.356

TK: Technological Knowledge; CK: Content Knowledge; PK: Pedagogical Knowledge; TPK: Technological Pedagogical Knowledge; TCK: Technological Content Knowledge; PCK: Pedagogical Content Knowledge.