



PHILIPPINE STEAM EDUCATION IN FOCUS POLICY BRIEFING

Research and Analysis from
TPACK in Philippine STEAM Education Program



Enhancing Technology Integration Practices for Philippine STEAM Education

Education 4.0 calibrates the learning system with emphasis on blending of virtual and cyber-physical worlds. In addition, Education 4.0 poses STEAM Educators to adapt address the demands especially in the area of technology integration inside a STEAM Classroom. In 2015, the Philippine ranks 98th in the ICT development Index, which is used to monitor and compare developments in information and communication technology (ICT) between countries and over time. However, there are still some barriers to technology integration. Thus, this brief reports the technology integration practices of Philippine STEAM educators grounded on development of a self-rating proficiency indicator for STEAM educators grounded on technology integration model for Philippine STEAM Education.

Source: *Measuring the Information Society Report 2015 Executive Summary*

Economy	Rank 2015	IDI 2015	Rank 2010	IDI 2010
Korea (Rep.)	1	8.93	1	8.64
Denmark	2	8.88	4	8.18
Iceland	3	8.86	3	8.19
United Kingdom	4	8.75	10	7.62
Sweden	5	8.67	2	8.43
Luxembourg	6	8.58	8	7.82
Switzerland	7	8.56	12	7.60
Netherlands	8	8.53	7	7.82
Hong Kong, China	9	8.52	13	7.41
Norway	10	8.49	5	8.16
Japan	11	8.47	9	7.73
Finland	12	8.36	6	7.96
Australia	13	8.29	15	7.32
Germany	14	8.22	17	7.28
United States	15	8.19	16	7.30
New Zealand	16	8.14	19	7.17
France	17	8.12	18	7.22
Monaco	18	8.10	22	7.01
Singapore	19	8.08	11	7.62
Estonia	20	8.05	25	6.70
Belgium	21	7.88	24	6.76
Ireland	22	7.82	20	7.04
Canada	23	7.76	21	7.03
Macao, China	24	7.73	14	7.38
Austria	25	7.67	23	6.90
Spain	26	7.66	30	6.53
Bahrain	27	7.63	48	5.42
Andorra	28	7.60	29	6.80
Barbados	29	7.57	38	6.04
Malta	30	7.52	28	6.67
Qatar	31	7.44	37	6.10
United Arab Emirates	32	7.32	49	5.38
Slovenia	33	7.23	27	6.69
Czech Republic	34	7.21	33	6.30
Israel	35	7.19	26	6.69
Belarus	36	7.18	50	5.30
Latvia	37	7.16	34	6.22
Italy	38	7.12	31	6.38
Greece	39	7.09	35	6.20
Eikowal	40	7.08	30	6.25
Suriname	85	4.99	100	3.39
St. Lucia	86	4.98	70	4.28
Seychelles	87	4.96	81	3.98
South Africa	88	4.90	88	3.89
Panama	89	4.87	79	4.07
Ecuador	90	4.84	90	3.89
Iran (I.R.)	91	4.79	99	3.48
Jordan	92	4.75	84	3.82
Tunisia	93	4.73	93	3.62
Albania	94	4.73	89	3.65
Mexico	95	4.68	86	3.70
Cape Verde	96	4.62	107	3.14
Kyrgyzstan	97	4.62	112	3.02
Philippines	98	4.57	105	3.16
Morocco	99	4.47	96	3.55
Egypt	100	4.40	88	3.48
Fiji	101	4.33	102	3.28
Viet Nam	102	4.28	94	3.61
Dominican Rep.	103	4.26	101	3.38
Peru	104	4.26	91	3.64
Jamaica	105	4.23	95	3.60
El Salvador	106	4.20	110	3.10
Bolivia	107	4.08	113	3.00
Indonesia	108	3.94	109	3.11
Ghana	109	3.90	100	3.98
Tonga	110	3.82	111	3.08
Botswana	111	3.82	117	2.86
Paraguay	112	3.79	108	3.11
Algeria	113	3.71	114	2.99
Guyana	114	3.65	103	3.24
Sri Lanka	115	3.64	115	2.97
Belize	116	3.62	104	3.12
Syria	117	3.48	106	3.14
Namibia	118	3.41	120	2.63
Bhutan	119	3.35	128	2.02
Honduras	120	3.33	116	2.94
Guatemala	121	3.26	118	2.86
Samoa	122	3.11	121	2.43
Nicaragua	123	3.04	123	2.40
Venezuela	124	3.03	126	2.40

Figure 1. IDI overall rankings and ratings, 2015 and 2010

“The technology integration model provides the framework on how technology integration is reflected to achieve quality STEAM education.”

At a glance

The current technology integration practices of STEAM educators are centered on the use of multimedia in their STEAM lessons. These technology integration practices of STEAM educators are profiled based on the frameworks of TPACK, SAMR (Substitute, Augment, Modify, Redefine), and Triple E (Engage, Enhance, Extend) through a country-wide survey investigation. Further analysis modelled the technology integration of Philippine STEAM educators.

HIGHLIGHTS

Technology integration practices in Philippine STEAM Higher Education is young compared to country counterparts as indicated by the analyzed practices in terms of the different technology integration frameworks (TIM, Triple E, SAMR, TPACK).

The crafted technology integration model features the three interrelated variables: teacher technological knowledge, institutional support, and the outcomes, to produce STEAM learners/professionals. The model suggests relevant and quality professional development programs to capacitate the STEAM teachers in terms of technology integration and support from the institution. The model is aligned to the PSGs of STEAM disciplines, TPACK model and the PPST.

KEY MESSAGES

- ✓ Improvisation of tools and equipment is considered one best practice to integrate and augment usability and availability construct of technology integration of STEAM teachers.
- ✓ There is a need for sophisticated and complicated tools to increase technological engagements in STEAM disciplines especially in the sciences and agri-fisheries.
- ✓ The model intends to provide opportunities for the STEAM educators to update or adapt to new technology used in the classroom and provide opportunities to capacitate STEAM educators
- ✓ The Technology Integration Model has three major variables: teacher technological knowledge, institutional support, and the outcomes – to produce STEAM learner professional

POLICY RECOMMENDATIONS

1. Prioritize budget appropriations from legislative, budget and finance agencies of the government by giving capital outlay to State Colleges and Universities (SUCs) to create programs that require to build technology-related infrastructure and other related technology necessities to further promote quality STEAM education and produce STEAM professionals in the country.
2. Focus on the faculty development programs of the SUCs by providing teacher trainings and other capability building programs to enhance the technology integration practices of many STEAM educators
3. Craft memorandum orders for SUCs to conduct technology integration-driven researches and other innovative programs for STEAM education including giving state grants or other forms of financial support to SUCs to further the technological advancements for STEAM education in the country.
4. Expand the STEAM teachers benefits (e.g., 20% discount on the purchase of school, and STEAM-related devices) to address technological affordances.

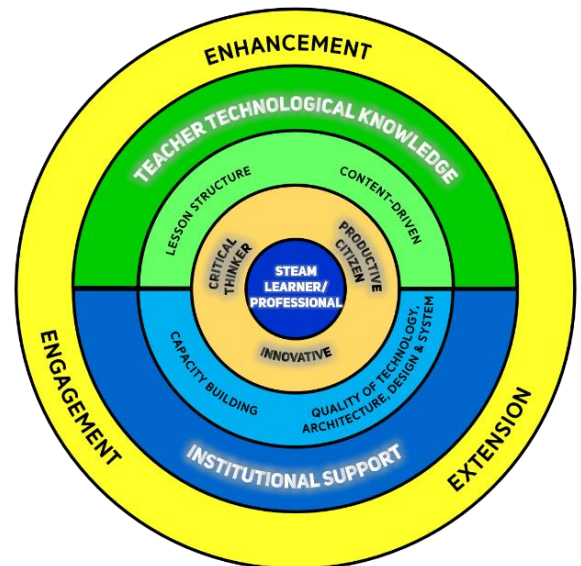


Figure 2. Responsive Technology Integration Model

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