

Development of the Paulinian Flexible Learning Model for instructional delivery in the time of COVID-19: A Design Thinking Approach

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Abstract: *The study aimed to develop a Paulinian flexible learning model that will facilitate the delivery of off-campus instruction in St. Paul University Manila while the students are not allowed to return to the university for face-to-face instruction. To do so, the research sought to uncover the learning experiences of the students during the community quarantine period, determine their connectivity status, learning preferences, and online practices. The study used a sequential four-phase mixed research design. The study, following the first four phases of the Design Thinking Approach, conducted a preliminary survey of conveniently sampled students and teachers from different colleges to navigate areas of concern related to the ongoing online delivery of pandemic-interrupted courses. Based on the results of the preliminary survey, the researchers constructed an expanded survey questionnaire that looked at the connectivity status, learning preferences, and learning schedule. It was administered online to conveniently sampled 311 out of 396 (or 78.5% of) currently enrolled undergraduate students across five colleges in St. Paul University Manila during the next block of course schedules. Thereafter, the data were analyzed and interpreted, and different models were proposed and reflected on by concerned administrators. Once the flexible learning model was finalized, it was implemented, and appropriate tools were developed to appropriate the model in the last set of courses in the second semester.*

Keywords: *Flexible Learning Model, Instructional Delivery, Paulinian School, COVID-19*

I. Introduction

When COVID-19 was declared a pandemic by the World Health Organization (WHO) (Twatchman, 2020) the schools were the first to close to prevent the spread of the virus among the youth (Tomacruz, 2020). As a result, it was up to some higher education institutions to decide to terminate the second semester and implement a mass promotion (CNN Philippines, 2020) seeing that school reopening remains uncertain in the remaining months. While some sectors saw the mass promotion as an act of compassion (Contreras, 2020), other sectors opposed it to “preserve academic integrity of all courses particularly board-based programmes and OJT [on-the-job training] where quality and content cannot be compromised” (Inquirer.net, 2020, para. 2). Many private schools, after months of community quarantine, may permanently close as a result of the interruptions caused by COVID-19 (ABS-CBN News, 2020). While the Department of Health declared that it will restart the opening of classes in basic education on August 24, 2020, despite the absence of any COVID-19 vaccine, virtual instructional delivery has become one of the options for schools (Pamaran, 2020) that see no viability in face-to-face classes just yet. However, it has become a contested option because connectivity is slow and the poor have very little access to computer hardware and Internet connection, Pamaran reported. The same is true for higher education. The Commission on Higher Education mandated ‘flexible learning’, which is not purely online, to address the connectivity limitations (San Juan, 2020) that deter poor students from accessing their education during the pandemic. In the remaining weeks of the second semester, instructional delivery to college students

was interrupted by the lack of preparation of students and teachers for online delivery (Reysio-Cruz, 2020). Online delivery of classes was also suspended (CNN Philippines, 2020). This brought about the need to research to develop a framework for instructional delivery that will guarantee quality education in a non-face-to-face learning interaction, despite the limitations in technology. This paper was written to share the findings that would assist other institutions to do the same and possibly, if appropriate or suitable, apply the framework to their institutions.

II. Review of Literature

21st-Century Learning. Before COVID-19, schools all over the world were already preparing for the changes that the 4th industrial revolution is already introducing in the educational system (London College of International Business Studies, 2019). In the Philippines, schools were still transitioning to the K-12 educational system at the level of basic education (Psychological Association of the Philippines, n.d.), and higher education institutions were doing the same as they made the necessary adjustments in the curriculum (Commission on Higher Education, n.d.). Thus, the Philippine education system was not even in stable condition when COVID-19 happened. Nevertheless, schools were already introduced to outcomes-based education (OBE) where learners are given more space to demonstrate skills that manifest their knowledge in a course (K12 Academics, 2020). In St. Paul University Manila, Dr. Bill Spady, one of the most prominent advocates of OBE that led the implementation of OBE in the St. Paul of Chartres Educational Ministry (Dychangco, 2018), facilitated the adjustments made in the curriculum to make sure that all programs are aligned and on the same page.

Simultaneously, the university also initiated steps to make its education more attuned to the requirements of 21st-century learning (Anastacio, 2016) that includes more projects, leadership, work-based learning, and guidance (Ark, 2019) and emphasizes the development of learning, literacy, and life skills (Stauffer, 2020). As computers become essential technology facilitating learning in the 21st century (Rosen, 2016), St. Paul University Manila embedded computer-facilitated design and documentation skills in the general education program in 2018 by embedding them in two courses, Purposive Communication, and Art Appreciation, with the help of New School of Arts and Design, based in Cebu. While a design laboratory was put up to facilitate learning in those courses, which became unusable during the quarantine period, the syllabus ensured that the skills were still learned given technologies available to students at home, mostly android mobile phones. Though the learning experience was different, the enhanced syllabus made sure that the students were given better learning opportunities relative to other students in other schools despite the limitations. However, the university wanted to know how that could be done for other courses systemically following the flexible learning delivery mandated by the Commission on Higher Education.

Worsened Digital Divide in the Philippines. In 2016, it was reported that the Philippines only had “a meager average Internet speed of 2.8 Mbps, placing the country at 104 among 160 countries” (Salac & Kim, 2016, para. 1). The Department of Information and Communication Technology (DICT, 2017) reported in 2017 that “the Philippines (at) at 6th out of 15 Asia-Pacific countries with an average mobile internet speed of 8.5 Mbps” (para. 1). While the rise in Internet speed is significant within the country, it is still behind other countries in the Asia-Pacific Region, especially the developed ones. In February 2019, the fixed broadband Internet speed was 19.28 Mbps and mobile broadband was 14.46 Mbps (Mercado, 2019). Given that fixed broadband Internet penetration in the Philippines is 3.23% in 2017 and 3.68% in 2018 (theglobaleconomy.com, 2020), connectivity at home will be an issue for many learners, and learners in a family will have to share and contribute to the connection lag. and increase the economic stress in their families due to higher Internet spending alongside economic losses during the COVID-19 community quarantine and after. It will be more difficult for families with no fixed broadband Internet connection or those in the lower-income brackets given that the bills have not stopped mounting (Fenol & Guinto, 2020) even if their sources of livelihood were interrupted or ceased indefinitely (Alindogan, 2020). This puts economically marginalized students at a grave disadvantage (Coronel, 2020).

For a profit-oriented private school, the problem might be how to make sound business decisions to keep the school afloat during the COVID-19 period (Magsambol, 2020) when schooling is not the priority (Lalu, 2020). For a non-profit school owned by religious congregations with a mission to serve the marginalized, the problem is how to keep education accessible (Lucenio, 2020) despite the drop in enrollment (Ramos, 2020). St. Paul University Manila, while waiting for the time when students can safely return to school, offered its dormitories as living quarters for the frontliners of the neighboring Philippine General Hospital. Meanwhile, the academic units used the time to continue the interrupted instructional delivery in ways that are more convenient to students, giving more time to them to accomplish requirements for a course, and develop the flexible learning framework that will improve learning given the worsened digital divide. The main concern in the desired flexible learning framework was how to sustain educational innovations and keep the institutional graduate outcomes given that the conditions for the delivery of education have changed and students' learning settings and dispositions were negatively affected by the pandemic. Hence, knowing the connectivity status of the students and their learning preferences was key in the design of the framework.

Integral Learning in the time of COVID-19. St. Paul University Manila's mission is to facilitate the development of an integrated human being who is ready to serve (St. Paul University Manila, 2020) society at large given the competencies they gained in the university. The said mission was constructed with the mission of the Sisters of the St. Paul of Chartres (Ang, 2011) and the mandate and principles of Catholic education (Campbell, 1994) in mind. While the goals of Paulinian education have not changed, the learners of each school under the St. Paul of Chartres Education Ministry are distinct in their living conditions and learning preferences. Each school directly responds uniquely to the conditions impacting each student by designing its learning tools accordingly. Given the new adjustments being done due to K-12, OBE, and internationalization, COVID-19 posed a new and even more overwhelming challenge that must be addressed immediately before the new academic calendar opened. Knowing that the mental health of students was greatly impacted by COVID-19 (Barr, 2020), the university had to ensure that instructional delivery using a flexible learning framework must be sensitive and responsive to the state of the mental health of its learners. This meant that integral education must become an even more important consideration in the design and component of the desired framework.

Integral education requires that students are asked to (1) go beyond their comfort zones and take risks, (2) go towards learning experiences that contribute to their self-worth and sense of accomplishment, (3) take ownership and become agents of their learning, and (4) draw meaning from their learning experiences (Atkin, 2000). That said, the framework should be operationalized where the students are physically, psychologically, emotionally, socially, and spiritually so that a responsive learning delivery model can be designed within the context of COVID-19, a situation no one has yet experienced in this lifetime. Integral learning, usually part of the hidden curriculum, requires empathy (Makoelle, 2019). To produce compassion in learners, a Paulinian graduate outcome, the mode of design (Pal, 2020), and delivery (Makoelle, 2019) must be compassionate, as well. Hence, learners needed to be consulted regarding their learning experiences in the time of community quarantine, especially because online delivery of instruction was partly implemented when in-campus classes were canceled. Knowing their experience during that period is a good starting point for problem-solving using the Design Thinking Approach, where rough prototypes are immediately experimented on by target users (Torabi, 2020) to allow for iterative fine-tuning during the actual testing phase. It should be noted at this point that the emergent flexible learning framework originated from a trial online delivery of instruction where initial feedback was drawn to guide the following survey of learners' needs. Unlike other surveys where hypothetical situations were assumed, in this study, the survey derived data from an experience of online education – that is in the latter half of the course immediately interrupted by the community quarantine period. The resulting framework presented below was immediately implemented in the next batch or set of courses delivered as 4-week modules.

Study Framework

The Design Thinking Approach (DTA) is consistent with the research mission of St. Paul University Manila, that is, to promote greater understanding and practice of compassion through research. Design Thinking strives to solve problems by developing solutions through a deep understanding of the users and beneficiaries of the developed solution. It starts with empathy (Pal, 2020). The DTA has five phases: empathize, define, ideate, prototype, and test (Interaction Design Foundation, 2020). The 'empathize' phase requires the researchers to gain a deep understanding of the problem that needs a solution – in this case, the online delivery of course modules. 'Empathizing' started when the academic units started asking their students about their experiences in the online delivery of modules halfway through the course schedule. The 'define' phase involves analyzing data from the previous phase to define the core problems constituting the challenge. This involved meetings among administrators to share and reflect on the data resulting in the identification of specific sub-challenges that must be addressed. The 'ideate' phase is intended to generate ideas. This happened when a select number of administrators were assigned to create possible flexible learning models that can help address the 'flexibility' gaps in the delivery of instruction. For the 'prototype' phase, the academic head, having a wider perspective of the problem, decided on the final flexible learning model that included tools for implementation. The 'testing' phase is the period of implementation of the first version in the first iteration of the flexible learning model, which is the next phase of this research. This paper reports the problem-solving process until the prototype phase.

Statement of the Problem

The study aimed to develop a flexible learning model that will facilitate the delivery of off-campus instruction in St. Paul University Manila while the students are not allowed to return to the university for actual face-to-face instruction. To do so, the research sought to uncover the learning experiences of the students during the community quarantine period, determine their connectivity status, learning preferences, and online practices, and develop a flexible learning model responsive to their situation and corresponding tools under the mandate of the Commission on Higher Education for the flexible delivery of instruction and the intended graduate outcomes of the university, and appropriate tools to help implement the said model to the upcoming set of modular courses. The said model seeks to integrate the Paulinian orientation and remain consistent with the Paulinian graduate outcomes.

III. Methodology

The study used a sequential four-phase mixed research design. The study conducted a preliminary survey of conveniently sampled students and teachers from different colleges to navigate areas of concern concerning the ongoing online delivery of interrupted courses. It should be noted that, unlike other schools, St. Paul University Manila already implements a modular delivery of courses in college where each course is taken for three hours every day for four days every week within four weeks. Hence, the closure of schools happened halfway through the third block of scheduled modules. Based on the results of the preliminary survey, the researchers constructed an expanded survey questionnaire that looked at the connectivity status, learning preferences, and learning schedule. It was administered online to conveniently sampled 311 out of 396 (or 78.5% of) currently enrolled undergraduate students across colleges during the next block of the module schedules. Thereafter, the data were analyzed and interpreted, and different models were proposed and reflected on. Finally, once the flexible learning model was finalized and the proposed model integrated, appropriate tools were developed to implement the model in the last set of modules in the second semester. The model was implemented across all the remaining modules of the second semester. The findings from the implementation of the model, the testing phase of the DTA, are not part of this paper.

IV. Discussion

Results

The results from the preliminary and final survey are presented and discussed in the context of the flexible learning model discussed separately at the end.

Internet Connectivity

Only 144 or 46.3% of students have stable Internet access plus backup data from a mobile phone. Meanwhile, 53.1% of the students have irregular Internet access (shared with family) and a mobile device with messaging capacity. When developing the model for flexible instructional delivery in St. Paul University Manila in the time of COVID-19, the first consideration is Internet connectivity. More than half of those surveyed said they have an irregular Internet connection. But more than those, there were still some students who have no Internet connection at home. This means that the university must be able to deliver instruction to learners who mostly have no or irregular Internet connection, if the university intends to keep all of its students.

Learning Preferences

The data reveal that the learners who are graduates of senior high school are heavily audio-visual learners (63%), and more visual than aural (25.7% vs. 8%, respectively). This requires that teachers should be able to translate their learning tools to address this learning preference. Several challenges in this regard surfaced: (1) that learning tools must be more audio-visual – same result as in the preliminary survey; (2) that there must be effective delivery of the audio-visual tools found on online platforms (this requires an understanding of online user experience and the importance of user interface because this will clarify the optimal learning opportunities and targets); and (3) that the teachers must be helped on how to use the audio-visual tools developed by the teachers effectively in any of the three modes of delivery – offline, blended or flipped.

The top three preferred learning strategies (in decreasing order) are discussion (86.5%), lecture (83.9%), and video (62.7%). Note that the findings are not disaggregated according to disciplines (which would reveal more contextualized preferences). Nevertheless, the three show that learners from St. Paul University Manila, or the learners in general (if the former reflect, to some degree, learners from other colleges and universities) remain more conventional in their learning preferences than unconventional. While they have been boxed into the gadget-attached stereotype, they are learning more from the strategies that were already used decades before the Internet became mainstream. Less popular strategies were email (38.6%), group activities (29.9%), and audio resources (27.3%). Given that, teachers from any discipline must be able to deliver those strategies both online and offline. This is going to be more difficult for students without online capability, but the use of the mobile phone and free social media messenger (Facebook) could be an opportunity to bring the discussion into the picture at the very least.

The results on preferred learning intake (specific examples for full understanding at 73%, simple explanation at 68.5%, specific facts at 49.2%, and main idea at 39.9%) support the notion of 30-minute segments where each segment is a presentation of one main idea with elaborative examples which contextualizes the idea more clearly. Teachers must learn to prioritize their lessons and focus on the MUST KNOW. Strategies must allow for simple and clear presentations.

Results on learners' attention spans reveal similar distribution between those that have the optimal attention span of 1-2 hours with short breaks in between (34.7%) and those with an attention span of 30-60 minutes (30.9%). The smaller number of students falls under above two hours with short breaks in between (14.5%) or shorter than 30 minutes (12.5%). In a scenario where Internet connectivity is unstable or unreliable, instructional delivery should lean towards the shorter learning period – 30 minutes bridge the gap between the shortest and the median attention span. To bridge the 30-minute median to the longer attention spans, it may be good to design two-hour sessions as composites of smaller 30-minute sessions or less. For example, a two-hour learning

session can be designed as a composite of three 30-minute sessions with two 15-minute breaks after the first and the second mini-sessions (This is for a classroom set-up). This may not be the case for home learning as the students can do a session shorter than 30-minutes or longer, depending on the conditions at home, which are beyond the control of any teacher.

It must also be considered that the Internet connection at home may not be enough to support the streaming or downloading of longer videos. Single videos around 5 minutes long are easier to download and process. Thus, the 30-minute mini learning sessions may be constructed as a combination of five to six short video presentations by the teacher (to establish and maintain the learning relationship and rapport with the students before the actual session begins, present the starting content, and the synthesis of the content to be learned for the session). That is already a lot to take for 30 minutes.

Given the above five options for preferred learning outputs, it could be seen that the learners surveyed prefer both simple (reflection paper at 85.5% vs. written exam at 28.9%) and difficult (portfolio at 28.3% and research at 27.7%) outputs. It is up to the teacher to require these outputs where appropriate. In the context of flexible learning delivery, certain outputs cannot be asked simply from an online exchange.

Given the context of COVID-19 and how it pushes people to look into their struggles and deal with personal difficulties that do not emerge in more social environments, the reflection paper can be both academic and therapeutic. Reflection papers must, therefore, be considered a valid tool to evaluate learning for subjects that require mostly reflection and internalization of knowledge, potentially for a higher purpose or in preparation for a larger project requiring a deeper understanding of the human condition. However, skills, as an output of learning, will find very little from a reflection paper so this output will have its limitations. However, this manifests the students' preference for "independent" thinking and learning. Training or orientation is needed for both faculty and students on how to evaluate and write reflection papers respectively.

Finally, with regards to the mode of delivery, the majority of the students chose modular (64.3%) over the course delivery stretched within five months (conventional approach). This was considered an area of strength in the preliminary survey as students focused on only 2-3 subjects per block. This also showed a growing preference for the new mode of delivery which was just implemented in the 2019-2020 academic year. Only the second-year students saw the difference between the two modes of delivery in the university. However, first-year students experienced conventional delivery in other schools in high school. This means that the modules which are composites of 30 minutes sessions with breaks in between will not run counter to majority preference.

Considerations for the Development of the Flexible Learning Model

Given the analysis of the two surveys done, the model must be able to consider the following:

The classification of students in terms of connectivity is "limited connectivity" wherein the recommended modes of learning by the Catholic Education Association of the Philippines include modified hybrid and remote learning. The university must also look after the least of its learners and that means providing options to deliver it without the Internet or given limited connection.

Meanwhile, those with Internet connection must be allowed to use that for independent learning or as a means to support those who do not have the same. This means that the school must enable its teachers to deliver instruction in three ways: (1) completely offline (no face-to-face); (2) blended (equally online and offline); and (3) flipped (more online than offline). The first implication of this is that any syllabus must have three options for delivery.

This is what constitutes flexible learning delivery.

- (1) The learning preferences of the students and the ability of the faculty to translate their learning tools to address this.
- (2) The preferred learning strategies of the students are discussion, lecture, and video – but this time, delivered in a flexible mode.
 - (2.1) The underlying process behind the discussion is not so much the physical exchange in the classroom but the “interaction” which points to the social dimension of learning equally from teachers and peers (the lecture is more “input” from teachers than peers). That said, the flexible learning delivery model must, after effective use of audio-visual tools, integrate “interaction” with teachers and peers within the learning process offline, online, or both. The interactions must connect with audio-visual tools used. The link between interaction and audio-visual tools must be very strong.
 - (2.2) Still on preferred learning strategies, “input” from teachers must be available to balance audio-visual tools and discussions connected to the said tools. Note that in cases where discussion is already integrated, the preferred “input” could already be considered integrated. The lecture content, and perhaps the lecturer’s presence, must be migrated to an audio-visual form, usually the video format. It should be noted that teacher presence, given any length of the input, must be established visually to build the connection found in the classroom but was hijacked by the quarantine setting.
 - (2.3) The 3rd preferred strategy is video. It can be a film, a vlog, a PowerPoint presentation with audio, and the like. This does not mean that teachers should learn how to produce their videos. Millions of videos are, in fact, available online, and because of that, the challenge is choosing the right video for the learners and the topic for discussion. The teacher’s curation is key.
 - (2.4) Other Options. Email, print materials, and audio recordings present other learning strategies that must be provided to create a break from video use and diversify the learning experience. Because Internet connectivity is a real difficulty, it might be the last option following print materials (or eBooks) and audio-recordings (which can both be stored in a USB flash disk and connected to a mobile phone). Note, however, that reading a book on a mobile phone screen will be more straining to a learner; hence, an audio recording might be better for mobile phone users, and eBooks for laptop or tablet users. Designing the learning experience in a flexible delivery mode will require interspersing all these other options in between videos or within videos. Teachers should learn how to design learning given this prioritization of learning strategy options.
- (3) Varied and unique preferences of the students. That while they prefer lecture and discussion, they also clamor for interaction and guidance from the faculty. While they prefer specific examples, they have a short attention span and want sessions to be simple.
- (4) Subjects that may not be effectively delivered via flexible modes such as laboratory classes, skills-related subjects, and practicum. So, a need to revisit the curriculum map is to offer suitable subjects during COVID.
- (5) Other dimensions of the student's and faculty's lives may affect flexible learning such as mental status, physical ailments, and support systems. The presence of services on these aspects must always interface with the learning model.
- (6) Catholic and values formation must be woven within courses and across courses in the absence of a physical environment where values can be observed from daily practice.

The Three I's of Flexible Learning: The Learning Model of SPU Manila

The proposed model puts together the major points gleaned from the analysis of the surveys: that despite the new mode of learning due to COVID-19, the students learn best when the faculty facilitates the classes (input-based Instruction), can feel the presence of the faculty and classmates (Interactive Reinforcement) and be given the freedom to assimilate inputs and produce outputs (Independent learning).

The first section is “Input-Based Instruction” “led” by the teacher supported by the preference for the lecture strategy. This section may not be just about direct-to-content input but also about building rapport, establishing the context for the content, and guiding the student in understanding the content as they watch video learning materials. The last 30-minutes of this “input” may provide the synthesis before or after the “interactive” section within the two-hour learning period. A two-hour learning period, then, must already include all the inputs of the teacher. The second section must be embedded in the same two-hour learning session.

The second section is “Interactive Reinforcement” where personalized interaction with the teacher and peers (perhaps stimulated by a video viewing) can lead to a dyad, small group, or big group discussions on a free interactive platform, such as a post on a Facebook group chat or a discussion thread on the Facebook group wall. This is designed to reinforce the input by the teacher through socialized learning processes such as opinion-sharing, story-telling, critique-giving, feedback sharing, or showing appreciation and support.

The third section is “Independent Learning” which is supported by the students’ preference for reflection papers – this, in essence, should involve personal reflection and not necessarily the production of a reflection paper (although writing one’s reflection could have many benefits beyond academic). In a modular delivery of learning, this might involve offline learning experiences decided upon by the learner with the proper guidance of the teacher, concerning the content discussed, or choosing from options given by the teacher (say creating a music album he or she will listen to within an hour during the rest of the day, which talks to him or her about the lesson of the day; or taking photos of scenes at home that helped him or her understand more the concepts discussed during the day; or writing a story, true-to-life or fiction, that echoes what he or she learned). This is learning decided upon by the learner – an exercise of personal responsibility towards his or her growth – which must be shared with the class later on.

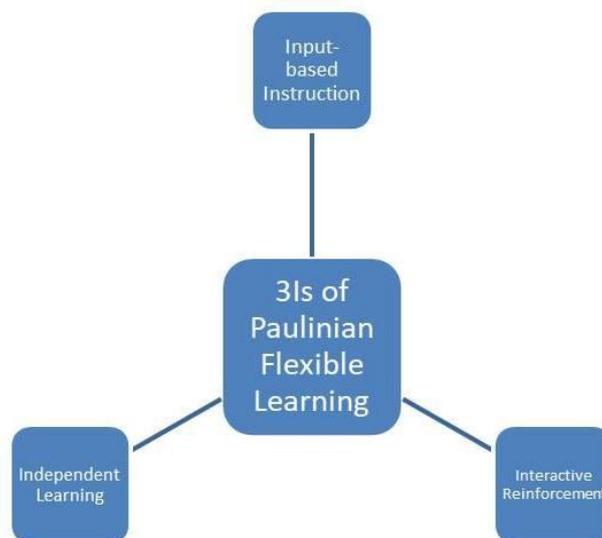


Figure 1. The 3Is of Flexible Learning in St. Paul University Manila

The SPU Manila 3Is Learning Model is the currently being used in the delivery of the flexible learning classes through the digitized learning packets (DLP). The implementation of this model also considers outcomes-based learning anchored on the Paulinian graduate attributes. The evaluation of this model is set at the end of every semester and improved based on the results of the evaluation surveys.

The following should be noted about Figure 1:

1. The model applies mostly to learning not covered by laboratory work or practicum, although being guided by the above model in the two contexts will be helpful as it is informed by research.
2. There is no one ideal sequence to the delivery of the 3 I's in a two to three hours learning period delivered as a module. There are three (3) possible approaches in the implementation of the model
3. The proper approach must be applied to courses that match with the particular outcomes of the course or the optimal learning process for them.
4. Connecting all 3Is is the use that audio-visual learning tools must be embedded in all sections and must help tie together all three sections.
5. Input-Based Instruction must be supported by the learning strategy preferences of the students
6. Interactive Reinforcement is supported to have the short attention spans of students supported or stretched by the interactive or social learning experiences beyond the input by the teacher.
7. Independent Learning is informed by the preferred output of the students where outputs are inspired by the independent learning choices students make after learning from the teacher and his or peers. This is also meant to further expand or stretch the learning experience of the students as he, she, or they voluntarily chooses to personalize his, her, or their learning experiences at the right time and place during the day. This allows for fully contextualizing the learning to the conditions experiences faced by the student every day.

The approaches (Input-based Instruction, Interactive Reinforcement, and Independent Learning) must be completed every session. But the sessions may not be done daily. This model will be used for the 'essential' topics identified by the faculty beforehand based on learning outcomes.

Figure 2. Approach 1: A Sample Implementation of Input-Based Instruction, followed by Interactive Reinforcement, and concluding in Independent Learning

Figure 3. Approach 2: A Sample Implementation of Interactive Activities (learning with peers first), followed by Input-Based Instruction by the teacher after the stimulating opening interaction, ending in Independent Learning.

Figure 4. Approach 3: A Sample Implementation that starts with Independent Learning followed by Interactive Reinforcement and ends with Input-Based Instruction.

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