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Positioning the Flipped Classroom Process for Adult Learning

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Abstract

The flipped classroom methodology is an evolving concept that has become enhanced by modern technology. The approach proceeds by delivering instruction to learners through a recorded video, while turning formal class time into a time for some learner-centered knowledge discovery activity. Thus, the flipped classroom is a learner-centered approach to learning. However, there have been a tendency in the literature to cast the flipped classroom approach as the ideal approach for engaging adult learners. This paper argues that while the flipped classroom methodology is a learner-centered knowledge discovery approach to learning, the approach does not necessarily satisfy all the desiderata of an adult learning theory. Although, class flipping will allow the learner to bring their prior experience to bear on those class activity sessions, it remains the case that the facilitator is still in absolute control of the process of setting the learning agenda and the evaluation thereof, without any input from the learners. In order to leverage on the advantages of flipped classrooms with respect to adult learning, there is a need to blend the flipped classroom process with the existing principles of adult learning. This will enable the derivation of an adult learning-oriented flipped classroom process model. This paper proposes such a process model that uses the flipped mastery process and appropriately apportions responsibilities using the principles of andragogy.

Keywords: Flipped Classroom, Andragogy, Adult Learning Theories, Learner Centered Activities, Knowledge Discovery Activities

Introduction

In the light of the recent advances in disruptive technologies such as Artificial Intelligence, that may change the nature of work, there is need for a huge amount of training and retraining for the existing and future workforce. Some of these are people who are getting retrained in order to be able to take up new roles in the emerging work place. Others need to be retrained in order to be able to continue in the role they had played for decades. This situation presents an interesting challenge for various countries and different countries are trying to face up to the challenge in different ways. For example, a country like Singapore is already investing significantly in

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retraining middle aged citizen so that they can adapt to the demands of new technologies in the workplace by giving a monthly training allowance to individuals (Yeo, 2024). In a similar development, Nigeria launched a scheme to train three million Nigerians in digital skills (Angulu, 2023). In fact, it has been found that countries that embark on a broad large-scale, nationwide training for its work force in terms of AI technology (e.g. Singapore and the US) eventually acquire a higher level of technological readiness for AI than those that focus on training a smaller group of experts with advanced AI knowledge or skills (e.g. China, Sweden and Canada) (Rigley, Bentley, Krook & Ramchurn, 2024). Thus, a large-scale training programme of the sort that countries like the United States, Nigeria and Singapore have embarked upon, is a good step in achieving national technological readiness.

However, an effective large-scale training programme of that sort requires more than just a budget. It also requires setting up an effective educational strategy. Such a strategy requires taking into consideration the basic fact that many of the learners are adults in every sense. Thus, their training must be planned while bearing that fact in mind. An aspect of that strategy involves the choice of teaching methodologies and training of trainers in those teaching methodologies. In this regard, there are a number of adult learning theories that must influence such a strategy. Those theories must take into consideration, the characteristics of the adult learners and how their mind work in the process of learning. An ideal educational strategy must also include the training of the subject experts who will train the learners in the strategies and methods to adopt in order to train and sustain the interest of adult learners. This is because the most successful approach for learners in the middle age bracket must reckon with their attitude to learning new skills, their learning styles and the fact that these are experienced learners who will learn best if treated as such.

There are three major adult learning theories that pervade the adult education literature. The first of these is *Andragogy* (Knowles, Holton III & Swanson, 2005) which is offered as an alternative to pedagogy which is the theory of learning with respect to young learners. The second of these is known as *Self-Directed Learning* (Leong, 2020) which accounts for how matured learners, that are interested in learning within a less formal setting, learn. The third is the *Transformational Theory* of learning, which accounts for the kind of learning that effects fundamental changes in different dimensions that span the psychological realm the convictions and the behavioural (Callejas, 2014).

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The Flipped Classroom methodology (Bergmann & Sams, 2012) as a methodology aims at bringing to the fore, the higher educational objectives of Bloom's taxonomy by bringing activities that promote these higher objectives into the classroom, while at the same time moving the activities that promote the lower objectives such as transfer of knowledge and understanding into the background by having learners engage in basic knowledge transfer activity outside the classroom prior to (what should be) home work time. This methodology has been in use for several decades under different names and it has been reputed as a learner-centered, discovery and problem solving or learner activity-oriented methodology.

Although the Flipped Classroom methodology originated in the US, apart from the US where it has gained attention among practitioners and researchers, it has also caught the attention of researchers and teachers in various other countries including the various countries of Europe, especially Poland e.g. (Andragorski-Zavod, 2016), Australia e.g. (Reidsema, Hadgraft & Kavanagh, 2017) and Nigeria e.g. (Itighise & Umana, 2019) and (Ogunleye, Onifade, Ogundeji & Sonde, 2024).

Our goal in this paper is to integrate the flipped classroom methodology into an adult learning theory such as andragogy, in order to obtain a version of the flipped classroom methodology that is particularly suited to the adult learners. Although the flipped classroom methodology is learner-oriented, it lacks all the other attributes that are expected for an adult-oriented methodology. Although, an adult learning theory like andragogy expects the facilitator to lead a learning discovery expedition in which everyone is a co-learner, learning from the collective, it is not explicit as to how this is to be done. On the other hand, while the flipped classroom methodology has a fairly explicit prescription for carrying out such learner centered knowledge discovery activities it prescribes, it takes no cognizance of a situation in which the facilitator is dealing with experienced learners who must get a feeling of being in control of the learning process.

A Tale of Two Philosophies: Flipped Classrooms and Andragogy

This section will focus on presenting the background on the two pertinent philosophies discussed in this paper. This goal is to lay the two philosophies side by side in order to see the pertinent aspects of the two that may be able to complement one another. This approach to studying the two

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philosophies will also help to discover some other important fringe advantages that the flipped classroom philosophy can confer on existing adult learning philosophies.

Flipped Classroom (FC) As a Philosophy

The flipped classroom model of learning involves the exchanging of traditional classroom activities with the activities of the learner outside the classroom, or home work. In this wise, the activities of actually disseminating knowledge which ordinarily takes place in the classroom is flipped with the activity-oriented aspects of learning which normally takes place outside of the classroom in the form of home work. Essentially, according to Reidsema, Hadgraft & Kavanagh (2017), the Flipped Classroom approach consists of "an online pre-learning session" followed by "a facilitated active session".

Going by Bloom's taxonomy of educational objectives, the classroom objectives which are lower on Bloom's hierarchy include, attaining knowledge and understanding, while the activities that normally take place outside the classroom, are those that are higher on Bloom's hierarchy and these are application of knowledge, analysis of knowledge, creating (or synthesis of) structures or designs from knowledge and evaluating what is created.

Although the origin of flipped classroom is dated back to the 19th century at the US Military Academy at Westpoint (Cronin & Coakley, 2018), the first real application and naming of the flipped classroom concept was by two American Chemistry teachers who faced a number of circumstantial challenges in teaching Chemistry (Bergmann & Sams, 2012). One of the major problems that Bergmann & Sams (2012) identified from their experience as Chemistry teachers, is the difficulty that students have translating their lesson contents as transferred from the instructor into the kind of knowledge that they need to be able to do the homework to which they were assigned. This is difficulty can be described as the ability of students or learners to move higher on the Bloom's taxonomy from knowledge and comprehension to application, analysis and synthesis. This is one good rationale for the flipping of classroom activity and home activity, so that the teacher can be involved in the transition of the learner from the lower levels on Bloom's hierarchy unto higher levels. There exist a number of variant models that have been identified in the course of practicing the flipped classroom concept (Andragoski-Zavod, 2016).

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In the *standard model*, the facilitator assigns videos to be seen by learners at home ahead of class time, while the learners are expected to use the class time to practice what they have learnt from the video under the watch of the facilitators. In the *discussion-oriented model*, the class time is devoted to discussion and exploration of the subject matter. This is particularly useful in the arts. In the *demonstration-focused model*, the class time is devoted to practicing some activity taught in the video. This is particularly useful for learning the practical side of the sciences and mathematics. The *faux-flipped model* is particularly useful for young learners for whom homework is not yet appropriate. For this model, the video is seen in class by the learners, while the facilitator goes around the class attending to any problem that the learner may have. The *group-based model* is like the standard model in which the class activity is done by groups of learners. In the *virtual-flipped model*, it is considered that there is no need for class activity. Thus, the activity is done alone by the user and submitted through a learner management system. In the teacher-flipping model, the facilitator flips his role with the learner. As such the learner is allowed to demonstrate their mastery of the subject by recording a video of themselves demonstrating their understanding of the subject. The group based flipped model described in (e) is applied in the Engineering field by Reidsema, Hadgraft & Kavanagh (2017).

However, criticisms exist in the literature against the flipped classroom approach (Andragorski-Zavod, 2016). These include the fact that there may be a "digital divide" among the group of learners that may put some at a disadvantage. Another problem is that matured students with increasing personal and family responsibility may fall behind in watching videos at home. But them a similar disadvantage exists for the category of students with other learning modes. Another problem is the fact that the flipped classroom model will get students to spend more time on computers, complicating an existing problem of over dependence on technology. Besides these, Arnold-Garza (2014) also pointed the fact that video classes remove the element of spontaneity, which is highly valued by some instructors, from instructional classes. A way of mitigating this, according to Arnold-Garza (2014) is by starting every class with a question-and-answer session.

Andragogy - The Philosophy of Adult Learning

The major adult learning philosophy in the literature is Andragogy (Knowles, Holton III & Swanson 2005). It was first in invented in 1968 by Knowles. The underlying idea in Andragogy is

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a determined departure from the principles of pedagogy which relates to learning takes place as a transfer of knowledge from teachers to learners so as to find a way to enhance the learning experience of the adult learner. That transformation is enabled by building a learning process that is mindful of the peculiar attributes of the adult learners. In the transformation from Pedagogy to Andragogy, learning transforms from a knowledge transfer process to a mutual knowledge discovery process involving both the teacher, whose role also transforms from that of a discharging knowledge bank to that of a facilitator of a knowledge discovery process, on one hand, and the learners on the other, as prescribed by Freire in his famous book "Pedagogy of the Oppressed" (Freire, 2000). The teacher, therefore stops being "the sage on the stage" in order to take on the role of the "guide by the side" (Andragorski-Zavod, 2016).

The basic attributes of the adult learner that motivate andragogy as identified by Lindeman, according to Knowles et al (2005) include the following facts: that the adult is motivated by recognizing their own need to learn, that adults learn best when what is to e learned is centered around real-life situations, that life experience is a key resource in adult learning, that adult learners have a need to be self-directing or take control of their own learning and that a facilitator of adult learning needs to be more mindful of the differences between individual learners than a facilitator of other kind of learners.

The other peculiar attributes of adult learners identified in the literature (Andragoski-Zavod 2016, Rubenson 2011) include the following facts: that their time is limited due to other commitments, that they have differing levels of prior knowledge and preparations, that it is reasonable to assume that they generally lack ICT skills, and that many of them need confidence boosting attention on the account of having dropped out of similar learning programs in the past. There is a sense in which the self-directing property in (e) and the special attention required by students with prior negative experiences in (h) combine together to help the facilitator know where their attention might be needed ahead of time.

Following from the attributes of the adult learner, Knowles et al (2005) analyzed the differences between the approaches to setting up the individual process elements in each of regular pedagogy and andragogy. These differences are described for each of the elements in (1) to (7) below:

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a. Preparing Learners: In the pedagogical approach, minimal preparations are needed, while in andragogy, the preparation needed is elaborate, involving the need for providing preliminary information, helping the learner to develop realistic expectations and to begin to think about contents of learning module.
b. Climate: The climate in the pedagogical approach the classroom climate is formal, strictly authority-oriented and competitive, while in andragogy, the climate is relaxed and informal making it mutually respectful, mutually collaborative and collaborative among learners along with the facilitator.
c. Planning: In pedagogy planning is the exclusive responsibility of the teacher, while in andragogy planning is a joint task between facilitators and learners.
d. Diagnosis of need: In pedagogy, this is the exclusive duty of the teacher, while in andragogy, it is a joint task involving the facilitator and the learner.
e. Objective setting: In pedagogy, this is the exclusive duty of the teacher, while in pedagogy, objectives are jointly negotiated by learners and facilitators.
f. Learning Activities: In pedagogy the act of learning is a basic transfer of knowledge from a teacher to learners, while in andradogy, learning is a mutual experience through experience.
g. Evaluation: In pedagogy, evaluation is the exclusive task of the teacher, while in andragogy, evaluation is the joint task of both learners and facilitators and it includes mutual re-diagnosis of needs and mutual evaluation of learning program.

The formal and authoritative nature of pedagogy means that most process elements are firmly under the control of the teacher, while the more informal andragogy requires the participation of both learners and facilitators in the process elements.

However, Andragogy has been criticized for paying too much attention to the autonomy of the adult learner and their need to take control of their own learning, while not paying any kind of attention to how other factors such as a person's history or culture or context may affect both the learner and the learning process itself (Merriam, 2011). However, in spite of these criticisms, Andragogy has gained a strong following on the account of the fact that many researchers can connect to the attributes of adult learners that it has identified, and their implications in terms of

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the appropriate *modus operandi* in the course of planning, instruction and evaluation (Merriam, 2011). As it turns out, the sort of classroom activities prescribed for the flipped classroom methodology tallies with the instructional prescriptions of andragogy.

What Should Attract Adult Educators to the Flipped Classroom Idea?

One well discussed advantage of the flipped classroom method in the literature is the fact that the preparatory video sessions allow each learner to learn at their own pace. This can go a long way to bridge the increasing variability of the learning pace within groups of adult learners. These variabilities within groups of learners are by far more profound than adult groups than in younger groups of learners.

There are similar themes running through the Flipped Classroom method and Andragogy. The most prominent of these is the active learning theme. This theme allows the goal of mutual knowledge discovery involving both the learners and the facilitator of learning. The Flipped Classroom methodology is driving a movement that emphasizes the "guide by the side" philosophy. This attribute of the methodology enables the facilitator to ensure that most if not all of the active learning activity to be easily life-centred. At the same time, the facilitator has the opportunity during the active learning process in the classroom, to identify each individual learner's weaknesses and misconceptions and help address them. This is something that adult learners who still suffer from past negative experiences while learning the same topics will find beneficial.

It is also fair to say that the level of preparation that the flipped classroom methodology demands is far much more than what an average pedagogical approach demands. This level of preparation required is more than just recording videos and preparing problem sets. It is also involves identifying the specific skill sets that facilitator plans on helping learners discover within individual learning sessions. This is similar to the elaborate level of preparation required for an andragogy. As part of the preparation, the facilitator may need to record test video files and let real learners comment on the clarity of video, the audibility of the audio and other features, that may render the lesson inaccessible.

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However, one significant desideratum for an adult learning methodology that is left behind in the flipped classroom methodology is the fact that the facilitator takes full responsibility for the planning as well as evaluation of the learning process. This is a significant attribute showing that the flipped classroom methodology does not actually qualify to be considered an adult learning methodology.

An Adult Learning Oriented Flipped Classroom Process

This section now presents the adult learning oriented flipped classroom process. The flipped classroom methodology presents a means of achieving the instructional objectives of andragogy which moves the teacher away from the "teacher-as-knowledge-bank" role and more towards the facilitator of knowledge role, who is also a co-learner in the process. A major attributes of such a process is what Knowles *et al* (2005) deem to constitute the *climate* of the process.

As noted by Knowles *et al* (2005) that climate of the entire process must be informal as against formal, flexible and relaxed as against rigid. The climate must be that of mutual respect between the facilitator and the learners, such as will oblige each party to appreciate the situation and the point of view of others. It must also be mutually supportive and collaborative. This is the best climate under which mutual knowledge discovery can take place. Thus, this is the climate under which the process described in this section must take place.

The process presented in this section (see Figure 3.1) is an 8-step process that starts with a planning step which is a step in which the facilitator(s) plan the overall process of learning. This may include planning a time schedule for the entire learning process. In doing this, the facilitators must be mindful of the fact that time schedules cannot be entirely rigid. The different learning paces of the learners should be accommodated. Those who learn fast must not be slowed down by the slow learners, while the slow learners must not be hurried by the fast learners.

The overall process is presented in Figure 3.1. There are eight steps involved. It is important to observe that statements written inside pairs of braces (i.e. {}) are comments about how the specific attributes of the step. For example, statements in such braces that start with "Resp." indicate who is responsible for taking the lead in the step to be taken. As should be expected in an adult learning philosophy, responsibility for most of the actions must involve both the facilitators and the

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learners. This is because learners want to take responsibility for significant aspects of their learning process.

The second step involves the diagnosis of learners' needs. This is the first major step in the process that brings together the learners and the facilitators and it requires such a delicate handling that would help initialize a friendly climate for the rest of the process. This step requires facilitators that are good at breaking the ice with new learners and gaining their trust and confidence. From a clear understanding of the needs of the different learners, an overall set of objectives for each group of learners can be fashioned out in third step. Carrying along the learners in objective setting is critical for success of the overall learning enterprise.

Figure 3.1 The Andragogy-Oriented Flipped Classroom Process Model

Step 1: Initial Planning {Resp.: Facilitator and/or Learners}

Step2: Diagnosis of Needs {Resp.: Facilitator and Learners}

Step 3: Objective Setting {Resp: Facilitator and Learners}

Step 4 Course Content preparation {Resp.: Facilitator and Learners}

Step 5: Prepare test video and note *video parameters* {Resp.: Facilitator}

Step 6: share test video {Resp.: Facilitator}

while check shows: learners are not satisfied with *video*

do {Resp: Facilitator}

adjust video {Resp: Facilitator and Learners}

note *video parameters* {Resp.: Facilitators and Learners}

share test video {Resp.: Facilitators}

while continue

Step 7: use the last noted *video parameters* to prepare actual lesson videos

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{Resp.: Facilitators}

Step 8: For each learner or learner group initiate the following process ***concurrently***: {Resp.: Facilitator and Learners}

repeat the following steps {repeat until lessons are exhausted}

| pick the next lesson

| supply picked lesson video {Resp.: Facilitator}

{Resp.: (for the repeat loop below) Facilitator and Learners}

| repeat {repeat until learning is formed for current lesson}

| | carry out class activity for picked lesson

{Resp.: Facilitator and Learners}

| | do formative evaluation of activity for picked lesson

{Resp.: Facilitator and Learners}

| until formative evaluation is good enough

| Carry out summative assessment {Resp.: Facilitator}

until all lessons have been taught

Clear objective setting will lead to the preparation of the course content, in step 4, that will meet those set objectives. There is need for mutual agreements between learner groups and their facilitators in deciding the specific content to be taught. In this, the facilitator of knowledge should be able to lead while convincing the learners as to what needs to be included in the curriculum to meet their learning objectives.

In preparing the videos for the flipped classroom methodology, care has to be taken to ensure that the learners will discover the videos parameters that are suitable for their leaning. This is the

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purpose of steps 5 and 6. Step 5 involves the production of the first trial video while step 6 involves the repetitive task of taking feedbacks from learners and implementing their feedbacks into a re-make of the video. The repetition continues until the latest video remake satisfies the learners. A few video versions may be made for outlier learners. The parameters of the last video versions in step 6 are used in step 7 by the facilitator(s) to create all the actual videos for the lessons.

Finally, step 8 uses the flipped classroom methodology to carry out the learning or the knowledge transmittal activity to adult learners. The are two repetition loops in step 8. The outer repetition loop of Step 8 contains a number of repetitions of the full range flipped classroom process for each lesson in the curriculum. Each repetition takes represents the full range of the flipped classroom process for a lesson. The repetitions thus, continues until all lessons are exhausted. Each single repetition contains the process of video watching and the classroom mutual learning activity. The classroom mutual learning activity is also repeated until the mutual learners, including the facilitator are satisfied that the outcome of the formative assessment is good enough. This is what constitutes the inner repetition loop. In other words, the inner repeat loop ensures that the class activity is repeated until mastery is achieved, as evidenced by the positive outcome of the following formative assessment. This model is the known in the flipped classroom community as the *flipped mastery model* (Bergmann & Sams, 2012). In that model, the classroom is not only flipped, but learning activity is repeated until mastery is achieved. The outer repetition loop applies the flipped mastery model for each lesson repeatedly until a positive outcome ensues in the following summative assessment. The responsibility for many of the actions involved in step 8 involves both learners and facilitator.

Conclusion

This paper has successfully produced a process model for an andragogy-oriented flipped classroom methodology. The motivation for pursuing this objective has been two-fold. The first has been to identify the weaknesses or strengths of the flipped classroom as a methodology for the facilitation of adult learning. In this regard, it was argued that while the flipped classroom methodology encourages learning by discovery in a way that allows experienced learners to bring their experience to bear on the learning process, the entire process of the flipped classroom methodology

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remains firmly within the grip of the facilitator. This is one situation that adult learners can find frustrating because they prefer to be in control of their own learning.

The second objective is to the examine the ways by which the flipped classroom methodology can help give some precision as to how andragogy can create learning activities that are inquiry-oriented and experience driven.

From this paper, we conclude that the flipped classroom methodology can actually complement the andragogy process model on the account that it provides a platform for mutual learning by experience through relevant learning activities. Besides, the flipped classroom process model and the planning process that should precede it should adopt more andragogy-oriented principles that would include learner participation, in order for the flipped classroom methodology to be amenable to adult learning.

Suggestions

A fitting suggestion here is for adult educators to begin to seriously consider the use of flipped classrooms as a means of delivering adult curricula. A major imperative in making good use of the kind of process model derived in this paper is for adult education departments and centers, as well as tertiary educational institutions to acquire the technology for creating videos and testing them. Apart from this, adult facilitators need to be trained in the most up to date approaches of using the flipped classrooms methodology.

On a more general note, there is a need for governments to pay attention to the research and development activities that lead to strategies for massive training and retraining of adult workers in the light of fast emerging disruptive technologies such as Artificial Intelligence. As stated in the in the early parts of this paper, there is a need to address the question of identifying the most effective strategies for fast tracking training in the use of those disruptive technologies. It is important to recognise the fact that the learners involved are adults, and therefore there is a need for adult educators to be involved along with subject experts in identifying and researching the most workable strategies the training goals.

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