



ANALYSIS PHASE: THE FOUNDATION OF INSTRUCTIONAL SYSTEMS DESIGN (ISD)

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Abstract:

An x-ray of the various Instructional System Models in literature reveals that some elements are common to all. This is the product of the ADDIE Model, a household name in the Instructional Systems Design family. This model is represented by an acronym; A (Analysis), D (Design), D (Development), I (Implementation) and E (Evaluation). While the paper has a succinct look at ISD on a general note; however, the focus of the discourse is on the first element (Analysis), the sure foundation on which the other elements/activities are effectively anchored. On this note, the paper specially aligned with such core features of the phase, covering; need assessment; determination of instructional goal; instructional task; audience analysis, objective statement; critical incident analysis; resource consideration and formative evaluation. The reason is that whatever transpires in the other 4-components of the Model is a reflection of their presence at this first and foundation phase, as we do not import anything new into an instructional system that was not part of the take-off phase.

Keywords: Bedrock, discrepancy, heterogeneity, domains, models

1. Introduction

No one dare attempt to erect a structure on a weak foundation without being prepared for the obvious consequences associated with such construction flaw. The structure will not only be resting on a sandy soil, its quality cannot also be vouched for. And when on the long-run the facility collapses which definitely will, the need for which such a facility sought to address would definitely persist and remain unresolved. It is to avert the

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colossal waste of time and resources associated with such a human-made error that the subject of foundation is never toiled with, in the building sector.

In education, just as in other non-civil engineering fields, foundation courses are given their due place if the field must survive the test of time. Foundation courses provide baseline and rudimentary knowledge on which more complex knowledge and skills fit effectively. They serve as a base on which advance courses in a field can be rooted and effectively anchored. Also, they provide general knowledge for all entrants into a field of study and a full grasp of what they offer makes navigation in such a career much easier and stress free. This is basically the essence of the foundation courses we offer at the faculty and departmental levels in our Ivory Towers. Even when non periodicals, the textbooks for instance are written, same consideration of foundation knowledge is the rule of thumb. The contents of texts are designed in such a manner that preliminary and baseline knowledge is presented first on which more complex contents are fitted. This scaffolding arrangement of contents is to ensure that learners are exposed to basic knowledge which should aid progression to higher knowledge.

In instruction design, a subject that deals with the creation of learning experiences that will guarantee the acquisition of knowledge, skill and attitude in such a manner that is not only effective, but also efficient and even appealing; the analysis phase serves as a sure foundation (Merill, Drake, Lacy & Pratt, 1996). Analysis is the bedrock on which the other elements; design, development implementation and evaluation effectively rest on. The implication is that when analysis of an instructional system is not given its deserved attention, for sure it will turn out to putting a cart before the horse or a thing of had I known at the end of the day. How then can we justify the huge sum sunk, the time spent and energy dissipated in instructional design? These amongst others lend credence to the invaluable place of analysis in any instructional system.

2. Instructional System Design (ISD)

Instructional System Design or Instructional Design for short is a discipline that prizes in the achievement of instructional results or desired learning outcomes by ensuring that instruction is created in such a manner that it is not only effective but also efficient, engaging and appealing. The subject of creating, deals with the activities and theories related to the whole complex process involved in the development of instructional materials, learning environment and larger teaching-learning systems (Molenda & Boling, 2010). Effectiveness of instruction is achieved when different instructional designs are capable of achieving stated objectives or desired learning outcome. However, in efficiency, it goes beyond effectiveness, in the sense that it seeks to establish which of the designs that will yield the desired result in the least available time and perhaps cost. Engagement makes instructional designs and learning a learner-centered activity. An instruction is appealing when it is designed in such a manner that the audience or beneficiaries are not only interested but also motivated when it is being used. Motivational designs are target audience sensitive, relevant to them, engaging, instill

confidence and guarantee satisfaction (Keller, 2008). It is only in this fashion that a desired result- oriented design can be guaranteed.

In order to achieve the herculean taste of making instruction effective, efficient, engaging and appealing to our learners, essential components of ISD/ID come to bear. These components for sure vary among instructional processes or models that are common in literature. However, irrespective of the divers' nature of these designs, they all have the same target, that is, facilitating learning so as to achieve maximum result. There are different instructional models, just as we have different car brands or models. Gustatson and Branch (2002) survey of instructional development models would be very relevant in this discourse. In their taxonomy of instructional development models, classroom-oriented model is common. To them, such major category has other subcategories of models. The Gerlach and Ely (1980) Content-orientation model; Heinich, Molenda, Russell and Smaldino (1999) ASSURE model and Newby, Stepich, Lehman and Russell (2000) PIE models are typical of Classroom-oriented models. The Bates (1995) Open and distance learning-based model and Seels and Glasgow (1998) Project-based model are sub-categories of the Product-oriented models. The Systems-oriented models are represented by Diamond (1989) Institutional system model and the Dick, Carey and Carey (2001) Needs assessment model. Though these models have their various sub-elements and domains where they can be deployed for the purpose they are designed to accomplish, one thing that is common among them is desired learning outcome.

A succinct look and perusal of the taxonomy and sub-class of the models, generally implicates a-five distinct activity which cuts across them all. This 5-main activity gave rise to analysis, design, development implementation and evaluation. This is the product of the popular ADDIE household name that has come to be in the ISD/ID family (Clark 2013a). When thoroughly applied, they influence significantly the attainment of intended outcome, help in human resource development and guarantee return on investment (Basil, 2007; Clark 2010; Desimone & Weroner, 2012). While the focus of this paper is on the first element which is the bedrock of the entire process; the second or design phase prescribes the nature, type and shape an instruction should look like, that is, the activities identified in the preceding stage-analysis. Development is another action stage where both drafting and storyboarding, templates, learning management systems (LMS) lessons, modules are created. Trial and full applications include the activities during the implementation stage, while evaluation especially the summative kind sets to confirm the fate of the entire instruction/programme. The emphasis on the summative type is necessary because the other category, which is formative evaluation, does occur right from the analysis phase and goes across the other elements to its finality. However, for the primary responsibility of this paper, the focus shall be on the foundation phase-analysis the bedrock of ISD/ID.

3. Analysis: Meaning and Essence

When the noun analysis, plural analyses is used in any setting, it sues for the separation, sorting out and identification of the various features and constituent parts that make up

a whole or phenomenon. The reason why we analysis a subject, situation and material is to ascertain their interacting and interdependent units and also confirm their role on our subject of interest. It is on this premise that the antonym is labeled as synthesis, which simply means putting things together or an assemblage of constituent parts to achieve a functional whole.

Analysis in instructional design sets to achieve exact purpose of identifying the various key elements that should be given due thought and consideration if a design be it a learning-kind for learners or training-kind for trainees must be a result-driven one. It is in line with this thought that in the thinking of Rossett and Sheldon (2001), it is rated as a study on how to figure out what exactly to do about a program. It ensures that training does not fail (Philips & Philips, 2002). So, the essence is on how to see that a programme (learning or training) conceptualized can be actualized. To achieve this noble course, conceptualization which involves thinking and information gathering becomes very crucial. The analysis phase is the preparatory stage of an instructional process whereby all the essential ingredients and elements that will be required for a proper take-off are considered and readily put in place. It is a phase that demands a proper x-ray of what materials must be provided for an enduring foundation that can withstand an envisaged structure. This is the basis why it is described as *the* (specific) and not *a* (non-specific) article, foundation on which instructional systems design/instructional development can be effectively anchored. It is these weighty ingredients, the core activities and considerations which must be factored at this phase that corroborate the immeasurable value and worth of analysis, in the field of instructional design and practice. These essential ingredients and activities of the foundation phase shall be approached under the following sub heads:

A. Need Assessment

One of the core activities executed here has to do with the definition of the need proper, aptly labeled need assessment. This is necessary as to be sure that the need truly requires instruction or training ab initio. The reason is that a non-instructional/training need for sure does not require instructional/training option. At times, the differences in performance could be due to ignorance, problems of motivation, wrong tools, wrong job placement (Molenda & Pershing, 2010). Need assessment seeks to establish between what is the current, the observed, the status quo and what should be, the expected or the ideal. The presence of a need is an indication that all is not well and because we are human, need itself is a component part of life. It exists in different forms. It could be normative; in which case we are comparing to a standard practice; or felt need as is the case when we just feel that we need something. A need would also be expressed one as we see what plays out in supply and demand scenario; it could be projected or future need as when we consider an initiative to cope and addresses current situations or comparative need as when we see attributes in others which we do not have (Lee & Owens, 2004)

Irrespective of their forms and kinds of needs, the identification of a need leaves us with a gulf, a gap or discrepancy which is an indication that all is not well. There is a problem manifest and its eradication suggests a closed gap. This is the exact assignment

of an intervention option in the instructional system parlance. It is therefore obvious that a measure that is geared towards knowing where we are and where we want or should be cannot be toiled with, in the true sense of it. This is exactly what makes need assessment an inevitable activity of the analysis phase.

B. Identification of Instructional Goal

This is typical of the Dick, et al. (2001) model. The identification of an instructional goal represents the overall target of all instructional activities. An instructional goal is influenced by the nature of an instruction. An instruction could have a broad target or just a specific one, depending on the need to be addressed. Whether broad or specific, goals represent long term targets of an instruction which are not tied to immediate outcome. This presupposes the fact they are not defined by measurable attributes though guided by prescribed tasks.

An instructional goal drives an entire instructional process. The reason is that anything short of the goal attainment renders the entire design a wasteful one and so does not qualify the name it portends to bear. Clear identification and specification of instructional goals makes statement of instructional objectives to be precise, specific and measurable. In other words, instructional objectives could be easily drawn from a well stated instructional goal.

C. Content Analysis

Selection of instructional content is a key activity of this foundation phase (Newby, Stepich, Lahman & Russell, 2000). Such content must be relevant, specific and meaningful. There should be a clear understanding of the life application of such instructional content to justify its worth and value. This thinking influences the contextual implications of instructional contents. Usually instructional contents arranged in a spiral format makes learning much clearer and easier as anchored by the elaboration theory (Reigeluth & Garfinkle, 1994).

D. Instructional Task

Instructional task achieved through a thorough and comprehension analysis leaves designers with the right activities and events to be executed in order to achieve the purpose of the instructional/training process (Dick et al., 2001). Instructional task is not a one-man activity. Both the instructor and learners are involved in handling such instructional task if meaningful learning must take place. In most designs, such task is obvious under instructional procedures where context development, instructional strategies or skills are spelt out ab initio. This is followed by performance activities required of the teacher as well as learners. These activities; teacher's and learners' performance activities specify in overt terms tasks to be undertaken for learning to take place. Instructional tasks specify the activities to be carried out in order to attain the goals on the long run. They could be in steps, sequential or branched. Whether sequential, chain or branched, one thing is clear, one activity leads to the other. So this phase envisages what should consist of the task to be pursued and how these tasks should be arranged.

Identification of instructional tasks obviously could lead to strategies to be deployed in such a case. It is at the analysis phase that how the task and best ways of conveying them via strategies are settled. This is what makes this phase a truly brainstorming phase, as it enables an instructional designer to think on the best possible ways of closing a gap even before putting them down in the desired shape and structure.

E. Audience Analysis

Also, a critical activity done here has to do with audience analysis. This is typical of most models (Gerlach & Ely, 1980; Morrison, Ross & Kemp, 1994; Heinich et al., 1999; Newby et al., 2000; Dick et al., 2001). This clarifies and specifies the right target audience that need the intervention proper. What are their current attributes or features? What are their current knowledge and skills level? The entry behavior and input competence of a target audience is settled for at this stage. The idea is that no meaningful programme can be mounted when the beneficiaries are not clearly defined. Or else it will amount to the mounting of a programme that is looking for an audience. Audience should come first before a programme is mounted and not the other way round. The success of a programme is achieved when consideration is given to the background, socio-economic factor, religious, sex, amongst others of an audience. The whole of these factors would definitely what next to obtain in the ID process. Audience analysis (Gardner, 2008; Kolb, 2014) also factors learners' learning preferences and styles, the heterogeneous nature of the audience even in terms of their multiple intelligences. Such analysis is conscious right at this stage of such intelligences as; logical, linguistic, rhythmic, naturalistic, visual, and tactile strength of learners, amongst others. This identification is considered vital, because of its relationship with the instructional strategies that could inform a given instruction or programme.

F. Objectives Statement

In line with the various activities above is also the place of instructional objectives as a component of this foundation stage. The type of instructional objectives that should guide an instruction is indicated at this stage. Whether it is going to be a cognitive, affective or psychomotor objective (Bloom as in Arshavskiy, 2013; Clark, 2013b) is influenced by the nature and intent of the instruction under consideration. The idea of ensuring that such objective will have to be stated in active verb form, specific, measurable, relevant and time-line specific is conceived right at this stage. It is this understanding that influences how the objectives will play out in the design stage of the entire process.

G. Critical Incident Analysis

An instruction or programme is very precise on its targeted knowledge or skill which every participant must strive to acquire. This specific area of concentration of an instruction/training constitutes what is referred to as the critical incident analysis under this discourse. Critical incidents represent areas of performance that are completed either effectively or not, and behavioural descriptions of instances of extreme cases

characterized by success or failure in performance. As such this analysis analyze the task list to determine the duties and tasks that are presently performed optimally, those important but lacking (Lee & Owens, 2004). So, the analysis phase is the phase that seeks to establish where it really hurts, the obvious mark of deficiency in knowledge, skill and non-performance on the part of a given target audience. Yes, this is a sure measure to ensure that the right remediation is offered at the right time.

G. Resource Consideration

Resources could be technological or non-technological resources. The former with the use of the modifier include the ones created and used in the field of instructional designs covering tools, materials, devices and people. Such ones as natural resource conveniently falls under the latter (Betrus, 2010). Also, resources are defined by design or utilization. When it is designed for instructional purposes, it belongs to the design category, but in the utilization category, in such a case resource serves other purposes outside the sole objective of instruction. Both analogue and digital devices have made teaching and learning less stressful in today's world. Pressure sensitive devices, computer, internet provisions, interactive environment, WebQuest and other learning management systems are technologies in the right direction. However, whatever angle form which resources are approached, one thing is sure that such technologies are meant to complement the effort of the teacher and no surrogates.

H. Formative Evaluation

A final activity that is associated with this analysis phase has to do with evaluation. Yes, evaluation, the formative kind, after all when considerations and reconsiderations are made of activities to be integrated in any instructional system, it is formative evaluation that is playing out. So, right from this first foundation stage, formative evaluation which seeks to confirm the concrete, sure and dependable nature of the formed work is crucial, if the design proper must commence. Formative evaluation being a component of evaluation is common in all evaluation models. However, while its counterpart, the summative type is executed at the end of an instruction/ programme, formative evaluation commences right from this foundation stage and thus guarantees the quality of education and training (Tesser, 1993). Surely it is a sure measure to ascertain that the need analysis done is proper, goal is well stated, and content very relevant, instructional task is goal-driven, objectives factored basic tenets and audience input competence well spelt out, amongst others.

4. Conclusion

Analysis as seen is a core component of any instructional design process. An adage has it that one has to bite before chewing. This is the meaning of analysis as used in the instructional design parlance. It therefore suggests that if an instructional design that should be capable of achieving such cardinal features as; effectiveness, efficiency, engaging and appealing, the foundation, which is the analysis phase, deserves to be given

a comprehensive and holistic attention. It is only in this wise that the meaningfulness of an intervention instructional plan or programme can be guaranteed.

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