

Exploring Design Epistemology Among Educational Researchers, Lecturers, and Students in Ghana

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Given the increasing complexity of higher education, the need for deliberate design has grown. There is an implied understanding within the design epistemological framework of Western studies that when instructional principles are fairly applied in higher education classrooms, educators might achieve improved learning outcome regardless of context. This study explores design epistemology among educational researchers, lecturers, and students in the specific cultural context of Ghana. Using a design task, the study identified substance of design epistemology in areas such as goals, teaching methods, assessment approaches, context, agents, and principles. There was limited variation in design epistemology among researchers, teachers, and students. Further, the results revealed that in the higher education context of Ghana, a shared instructional template significantly determines the design of learning environments and reshapes any design task into a development task. It is thus argued that instructional design is a highly situated activity in the sense that contextual factors, and the specificities of different higher education ecosystems may give rise to

differences in how educational stakeholders apply design principles and theories. The study illustrates the need for more research on actual contextualized design practice to provide emic perspectives of effective instructional design models.

Introduction

Higher education is confronted with multiple changes from various perspectives. The student population, for instance, has increased and has become more diverse (e.g., Teichler, 2020). Similarly, technological tools pervade the higher education systems and are increasingly used by students (e.g., Chan & Hu, 2023). Consequently, higher education has become more complex as more variables are to be considered, particularly in terms of instructional design and pedagogical decisions. To cope with this growing complexity, the need for a stronger focus on instructional design has been recognized (Goodyear, 2015). Instructional design offers approaches and models that highlight what is relevant to support student learning. It helps to conceive powerful learning environments that increase the probability that students will actually learn what they are supposed to learn in an instructional context (Reigeluth, 1983). In most Western literature, instructional design theories and principles are portrayed as generally and universally applicable. There is an implied understanding within the design epistemological framework of Western studies that when instructional principles are fairly applied in higher education classrooms, educators might achieve improved learning outcome regardless of context. However, instructional design is a highly situated activity in the sense that contextual and cultural factors, and the specificities of different higher education ecosystems may give rise to differences in how stakeholders in education apply design principles. At the core of instructional design is the need to analyze goals, target group and context (Brown & Green, 2019), and to specify the nature of the components of the learning environment and their constructive alignment (Biggs, 1996).

By designing instruction in higher education, complexity in the context as well as in the student population can be explicitly considered. Instructional design may also help to make more deliberate decisions about the use of particular teaching methods, assessment approaches and/or technological tools. However, for at least three reasons, design efforts of lecturers in higher education do not always achieve the intended results. First, based on their interpretation of the learning environment, students do not always act as expected by the teachers who designed the learning environment (e.g., Elen, 2020). Second, based on their interpretation of instructional design models, lecturers do not always design the learning environment as intended by the educational researchers and theorists who propounded the instructional design models. Third, based on their understanding of the cultural context in which learning will occur, educational researchers articulate instructional design models that do not always fit the context in which the models are actually used. These core issues present possible differences in knowledge about learning and instruction (i.e., design epistemology) among students, lecturers and educational researchers within the higher education ecosystem. In line with the proposal by Goodyear (2000), we use the term design epistemology to refer to that knowledge about learning and instruction. To better understand the issues related to the effectiveness of designed learning environments, this study explores design epistemology among students, lecturers and educational researchers within a Ghanaian higher education context.

Instructional Design and Design Epistemology

The field of instructional design (ID) has a long-standing history and aims at bringing forward models about the process of elaborating learning environments (process-oriented models), and about the outlook of such learning environments (product-oriented models). A widely distributed example of a more process-oriented model is the Analysis-Design-Development-Implementation-Evaluation (ADDIE) model (Molenda, 2015). One of the commonly celebrated examples of a model that focusses on the outlook of learning environments is the '4C/ID-model' (4 components instructional design model) (van Merriënboer et al., 2002). The use of ID models is based on the fundamental claim that using ID models while designing learning environments results in more effective learning. While a lot of research sustains that claim (e.g., Sarfo & Elen, 2007), the field also documents different issues that may reduce the potential power of the models.

First, it has been noted that most of the ID models presume the presence of a compliant learner— that is, a learner who behaves as expected by the ID model (Goodyear, 2000). We know from ample practice and research that this is not (always) the case. For example, in a flipped classroom setting, learners do not engage in the preparatory work that is needed to make interactive sessions productive. Rather, learners act as self-regulated agents who interpret the environment and act in accordance with their interpretation (Goeman et al., 2023). This repeatedly results in non-compliant behavior or what Elen (2020) refers to as 'instructional disobedience.' Therefore, it is important to compare how students as users of ID outputs differ in their thinking about design (design epistemology) from lecturers as ID practitioners, particularly in a Global South higher education context. Second, there is a (classical) theory-practice gap (Truong et al., 2019). While ID models propose specific steps such as Analysis, Design, Development, Implementation and Evaluation in the ADDIE-model or specific components of a learning environment (e.g., learning tasks, supportive information, just-in-time information, and part-task practice in the 4C/ID-model), lecturers do not necessarily engage in these processes or do not always include all the components in practice. Their design practice differs in numerous cases rather drastically from what is put forward by these models (Dicks et al., 2009).

A third issue is cultural. Knowledge and instructional design practices are culturally situated and fluid. As Reagan (2004) has clearly outlined, educational thought and practice are culturally bound. What counts as good educational practices in one cultural context (e.g., Western) may not be the same in, for instance, African or Global South contexts. This is also the case for instructional design. Jones and colleagues (2016) have argued that cultural contexts influence epistemological knowledge and its application to design processes. For example, Sharif and Gisbert (2015) have demonstrated that instructional design and what is considered to constitute instructional quality is culture specific. Given that most ID models have been predominantly framed from and based on Western epistemological and ontological standpoints, they require cultural fine-tuning (Heaster-Ekholm, 2020). As has been argued by Young (2014), ID models largely neglect the biases that may result from their situated epistemological and ontological perspectives. Therefore, it is important to study design epistemology in a specific non-Western context to contribute culture-specific insights that can broaden our understanding of instructional design practices and design knowledge.

An important factor that underscores these issues is differences in the knowledge that is important when designing learning environments. Goodyear (2015) calls this knowledge 'design knowledge' and argues that it constitutes one out of three lines of research on instructional design. The other two lines are studies on design praxiology, in which the process of designing and more specifically, how designers approach design tasks, is investigated; and studies on design phenomenology that analyze the products of design such as books or blueprints of digital courses. Goodyear (2015) formulates it as follows: "design epistemology (the study of 'designerly ways of knowing'), design phenomenology (the study of the form and configuration of designed artefacts), and design praxiology (the study of the practices and processes of design)" (p. 38).

Research on design epistemology specifically focuses on the knowledge that plays a role in designing. Concerning that knowledge, a distinction can be made between a structural component (what areas of knowledge seem to play a role) and a substantive component (what is the content of the knowledge with each of the areas). For instance, Goodyear (2015) notes that one kind of knowledge is 'meta-knowledge' on design and illustrates this by pointing at two conceptions of designing that designers may hold, which he labels as 'organic' and 'strategic'. Organic design is a bottom-up, localized, and endogenous process in a higher education ecosystem whereas strategic design relates to interventions that are deployed to meet external

pressures that threaten a system (Goodyear, 2015). While meta-knowledge refers to an area of knowledge, the two conceptions refer to the substance of that knowledge, (i.e. what knowledge people hold in that specific area).

Given the issues with respect to the effectiveness of instructional design, this study investigates differences in design epistemology of educational researchers as representatives of researchers who produce and articulate instructional design models, lecturers as practitioners of instructional design and students as users of the outcomes of instructional design activities. For example, the underuse of ID models may stem from differences in conceptions of design epistemology of researchers who develop these models and lecturers who implement them. Similarly, differences in design epistemology between lecturers and students may lead to varying interpretations of learning environment components, resulting in student use that deviates from lecturers' intentions. Additionally, given the Western origin of most ID models, there is a need to study design epistemology in a specific non-Western cultural context. By focusing on context-specific design epistemology, we hope to contribute cross-cultural understanding in terms of how different stakeholders within higher education ecosystem approach, interpret and utilize instructional design principles, and how context-specific design practices in a Ghanaian higher education institution may differ from universalized instructional theories and principles that have been mostly developed within Western educational contexts. A better understanding of the 'design epistemology' of students, lecturers, and researchers in the Ghanaian higher education context may help better our understanding of the root causes of issues in instructional design (in)effectiveness and identify potential solutions. Although the study is exploratory, variations among the multiple stakeholders and different groups are expected. The core question of this study is: What design knowledge do educational researchers, lecturers and students hold in a Ghanaian (non-Western) higher education context? This question is further divided into two sub-questions: (a) What areas of design knowledge can be identified? and (b) Within each identified area, what is the substance of that design knowledge?

Method

Study Context

This study was conducted at one of the technical and vocational education and training (TVET) universities in Ghana. Ghana, often referred to as the gateway to Africa due to its leadership in the independence struggle in Sub-Saharan Africa, is located on the West Coast of Africa, bordered to the north by Burkina Faso, to the west by Côte d'Ivoire, to the east by Togo, and to the south by the Atlantic Ocean. Ghana has a population of approximately thirty-one million people (Ghana Statistical Service, 2021). It is one of the most peaceful countries in Sub-Saharan Africa, with sixteen regions further divided into 216 local districts for administrative purposes. The capital city of Ghana is Accra. There are sixteen public universities, ten technical universities, and several private university colleges in Ghana.

The university in which the study was conducted, has a student population of about thirty-two thousand, nine faculties, and twenty-three academic departments. One of the principal goals for establishing the University is to provide higher education in TVET to develop skilled manpower for job creation and economic development, and to equip teachers with the relevant competence for teaching in TVET institutions. As a teacher education TVET institution, pre-internship, post internship, off-campus teaching practices, 3-month internship outside the university, attachment, innovative competition (ideas pitching), entrepreneurial projects, are important part of the essential requirements of the teaching and learning activities in the university. The university offers several undergraduate and graduate academic programs in general education, humanities, social sciences, and TVET. Given its mix of programs and learning areas, designing a powerful learning environment by and for different target groups (university administrators, lecturers, researchers, students) is key to realizing the unique mandate of the university.

Study Approach and Design

Given the exploratory nature of the study, we adopted a qualitative approach. In terms of design, we employed multi-method data collection techniques. Specifically, we interviewed participants while they were engaged in a design task. Participants were presented vignettes of six teaching methods, six assessment approaches, and four educational goals. For each of the four educational goals, participants were asked to select the most appropriate teaching methods and assessment approaches. Most importantly, during the interview, participants were asked to present arguments for their selections. The use of vignettes during the semi-structured interviews allowed for a systematic comparison of individual responses. Vignettes have been widely used to complement other data collection methods in social research (see Hazel, 1995; Hughes, 1998), to explore context-specific behaviors and clarify people's judgments about a given phenomenon (Barter & Renold, 1999). In qualitative research, vignettes enable participants to define specific situations in their own terms (Barter & Renold, 1999). The use of design task vignettes to complement semi-structured interviews in the present study enabled us to elicit important responses regarding educational goals, teaching methods and assessment approaches appropriate for individual needs and contexts.

Participants and Sampling

We purposively recruited fifteen (15) participants from one of the TVET-oriented teacher education universities in Ghana. The participants comprised five lecturers, five educational researchers, and five students, purposively identified and recruited by the last author. The inclusion of these three categories, lecturers, educational researchers and students, is due to their significant role in instructional design and implementation processes in higher education contexts. The student participants were in their second and third years in different undergraduate programs from various faculties and departments. For the lecturer group, we selected participants who had completed their graduate degrees (either PhD or Master's) at least five years ago and who were not involved in any major research projects in addition to teaching. For the educational researchers, we selected lecturers who were either pursuing their PhD degrees or had completed their PhD degrees within the last couple of years in a field related to education. In each group, participants had different disciplinary backgrounds. Most participants were male, with only 20% being female.

Study Procedure

The study was approved by the SMEC ethical committee of KU Leuven, Belgium, and all participants signed informed consent before participating in the study. All interview sessions began with an explanation of the study's purpose and a request for permission to record the session. In a one-to-one setting, each participant was presented with the same vignettes containing descriptions of teaching methods, assessment approaches and educational goals. The vignettes were presented in the same order for each participant: first the teaching methods, then the assessment approaches. We showed six teaching methods vignettes, six assessment approaches vignettes, and four educational goals vignettes. The four goals put forward were: knowledge, understanding, application, and creation/synthesis. Each interview started with introducing teaching methods and assessment approaches as possible alternatives. The teaching methods were presented in the following order: lecture, partially recorded lecture, practical exercise, (individual or group) assignment, and internship. A wildcard option was also available to allow participants to suggest any method they deemed relevant. For the assessment approaches, the order of presentation was as follows: written exam, oral exam (defense), continuous assessment, take-home exam, and portfolio. Participants could also select a wildcard for assessment approaches.

Each participant was asked to indicate which teaching methods and assessment approaches were most appropriate for courses with different goals. For instance, participants were asked what teaching methods and assessment approaches were most appropriate for a course that mainly aims at 'application.' During the design task, participants were interviewed to argue and clarify their choices through questions such as, "You have selected x, what makes it powerful as a teaching method or pertinent as an assessment approach?" Each interview lasted for between 30 to 45 minutes and was audio-recorded with the consent of the participants. Given the research question, the primary focus was on the knowledge invoked rather than the selections made by the participants. That knowledge can be inferred from the answers to the argumentation and clarification questions, reflecting participants' design epistemology.

Data Analysis

Given the research question, thematic analysis was employed as the qualitative analytical strategy. Analysis was a multi-stage process. Recordings were transcribed verbatim using Sonix.ai. The recordings were automatically transcribed, and then all transcriptions were checked while listening to the recordings repeatedly. Next, transcripts were imported into NVIVO for coding and further analysis. The transcripts were read back and forth for thematic coding (Braun & Clarke, 2006). We first engaged in open coding, generating code categories inductively from the data and regularly meeting in person to compare our categories, from which broader themes were developed. Analysis involved the inductive elaboration of a codebook (Ando et al., 2014). This process took several iterations with the initial eight transcripts. We generated initial code categories from the ideas and answers provided by the participants, in line with the study's focus. The resulting version of the initial open coding or codebook was used to semantically code the other transcriptions, leading to several alterations to the codebook (Braun & Clarke, 2006). Using a final version of the codebook, we engaged in more focused coding, where all transcripts were coded again to develop superordinate themes. The codebook was elaborated by considering the research questions. This implies that at the top level, areas of knowledge were identified, and at a lower level, sub-areas and substantive elements were coded. Based on that analysis, knowledge areas were identified as themes and substantive elements as the content of these themes. To identify these themes the structure of the interview and more specifically the labels of the vignettes used during the design task were used as the starting point. To reduce our biases and appropriately represent the contextual experiences of participants, we used reflexivity at all stages of analysis (Adjei et al., 2022). For example, the first author reflexively discussed emerging themes with the third author, inviting feedback and engaging in collaborative discussions and shared sense-making regarding how participants understood and identified areas of knowledge most appropriate for them and their substance. In the second phase, possible differences between the groups of participants in the areas of knowledge or their substance were examined. This was done by systematically looking for differences in the various codes.

Findings

The analysis revealed six areas of knowledge: goals, teaching methods, assessment approaches, context, agents, and principles. In this section, we first present the different areas of knowledge identified by participants along with their substance. These key findings/themes are presented with illustrative empirical quotes to substantiate them and help reveal their conceptual and theoretical implications. In the second part, we present the key differences among groups of participants.

Areas of Knowledge and their Substance

Goals

We identified goals as the first area of knowledge. Our study revealed that while educational goals were presented to the participants with an explanation, it was clear that participants did not necessarily follow the goals as presented. Rather they offered their own perspectives about goals. For example, one lecturer indicated that:

The knowledge, see understanding is a little deeper compared to knowledge. If you want to test students on understanding. I think the approach is a little different from knowledge. Understanding is a little deeper because we critically evaluate and align concepts [and] theories (P2_L).

Participants who make distinctions between goals, mainly provide specifications for 'knowledge' as a goal. A lecturer related 'knowledge' to 'facts' that can be easily retrieved.

I don't see when the goal is about knowledge. I don't see the student involvement so much because the student has no much role to play in coming out with the facts. Okay. Because these facts are there and the teacher or the teacher

is presenting them as they are (P10_R).

However, students do not make a distinction between knowledge and information or facts. As one student put it:

Because I believe that we search for knowledge. And currently, the world is so small in our hands that any knowledge you want to get, you can easily get it on the internet, reading books and having a, asking question (P13_S).

As can be gleaned from the quote, students considered and equated information with knowledge. Other participants had difficulties making distinctions between these goals. In particular, distinctions between knowledge and understanding were vague or even non-existent and also, the distinction between understanding and application was subtle as understanding is needed for application because through an application, students can demonstrate their understanding.

Teaching Methods

Teaching methods represent another area of knowledge. As indicated earlier, for each of the methods in the task (i.e., lecture, partially recorded lecture, practical exercise, individual or group assignment, and internship), participants were requested to specify reasons for their selection. These reasons are mostly what participants see as affordances of the specific method when a goal is considered. Results are presented in the order of the presentation of the methods in each session. The analysis revealed that the lecture method was clearly the most selected and most valued teaching method, especially when the goal was teaching for knowledge acquisition. Participants considered lectures to be appropriate because during lectures, a lecturer is available, and information can be systematically provided while at the same time interaction (if needed and wanted by students) can be engaged in. For example, one student said that:

Because in the lecture, uh, in the lecture delivery, the teacher or the facilitator gives us knowledge, concepts, ideas, theories to the pupils or the learners. So, it will be appropriate when you are asking, uh, student or learners to describe a concept, a technique, the theory, the best, uh, method of delivery will be the lecture method (P11_S).

This view was corroborated by a lecturer:

So mainly lecture in the auditorium. To me it really helps a lot. That is the time the student can know more, another concept of the topic, and that is when the lecturer can also know a lot about the students and the students. Let's say, for instance, 1 or 2 students are not familiar with something at that point, they have the opportunity [00:04:00] to ask the lecturer. To, I mean, to touch on that concept again. So, I think lecture in auditorium is very okay for me. You have I mean, the lecture has that full interaction with the student (P1_L).

It seems apparent that the lecture method was considered most appropriate because of its presumed potential for interaction and knowledge transfer.

(Partially) recorded lectures were considered to be valuable especially for some groups of students because they make information more widely available and recordings can be replayed. It mainly serves as a backup. As one researcher narrated:

You get that convenience, is there? Yes. And you have opportunity to like you even do it at your own pace also. Okay. So, a lot let me break it down. So, from this time to this what was said, you make your notes, you make sure [00:10:00] you understand before you move to the next. And now. That has been recorded. So, we do it at your own pace and your own free time, and that's your own understanding (P6_R).

As evidenced in the above quote, the instructional method adopted by a lecturer could be a function of the affordances of the learning environment in terms of time and material resources. For example, as the participant in the quote above reveals, though (partially) recorded lectures are deemed appropriate and valuable for some students, they are dependent on

“convenience” which could be the availability of digital tools and connectivity for instructional design by lecturers (ID practitioners) and students as users of ID outputs.

Practical exercises are especially relevant when the course is oriented towards practice and/or towards understanding the implications of what has been theoretically taught or learned in the classroom. Participants indicated that a major advantage is the presence of a lecturer, a room for discussion, and specific equipment in dedicated rooms (e.g., computer labs). As one researcher puts it:

They have had the classroom knowledge and Euh, the ability to apply them. The knowledge is not for its sake. It's for a purpose. There's an end to that knowledge, and I would prefer that during seminars, again, there will be aspects, uh, on the, on the, on the subject and then even not only experts, peer sharing of knowledge is also crucial. Then the practical exercises that there can be workshops, practical sessions, uh, PLCs, professional learning communities (P9_R).

Participants indicated that assignments can be very valuable. For them, whether these assignments are best given to individuals or to groups clearly depends on the specific topic or the orientation of the course. Participants noted that while individual assignments allow the lecturer to monitor the understanding of individual students, group assignments cater to more complex tasks and support peer learning, the exchange of ideas, and the recognition of multiple perspectives. For example, a researcher pointed out that:

Yes, because the group work will allow the students to come out with their various perspectives or their individual perspectives, and therefore they can share knowledge. And as they try to guess, they try to come up with their own perspectives and then also collaboratively try to agree on what they think is good or what they think, idea that they think are more appropriate, [00:09:30] idea that they think these are not correct, and that they can also agree and refine their various perspectives. I think that will help to deepen the understanding such that if some students are far away from the ideal because others are coming out with different perspectives, it also helps those students to understand the concept much better (P10_R).

Internship was considered to be an appropriate method as it offers an encounter with reality in the presence of a supportive and well-equipped environment. It allows students to get expert advice in real-life settings. As one of the researchers observed:

So, so that the person is not just only doing the practical form, then he [or she] can also team up with other people. And then uh, he [or she] can also be involved in normal office work or factory work so that it will expand this. Because this is theory. He [or she] has got to the theory, he [or she] has to get it. So, at the end of the day he [or she] has to apply it. So that is the, the stage where you go by pure practical individual group or an internship analysis. So that are the internship level, the, the student him or herself will demonstrate his [or her] abilities that he [or she] can do it. He [or she] can also learn it from others who are already in the field, so that he [or she] can get a full glimpse of whatever is being taught. Yeah (P8_R).

Assessment Approaches

Assessment approaches represent another pre-set area of knowledge. Participants selected appropriate approaches for courses with specific goals. In arguing about the selection, specific features or expectations were brought forward for each of the assessment approaches. We report the results by maintaining the order that was used when presenting the assessment approaches.

A written exam is considered to be the appropriate default strategy at the end of a semester for a course. The exams can contain multiple choice questions (MCQs) as well as essay questions. Written exams are valued by the participants as they

allow students to ‘give back’ what they have been taught. Written exams are individually completed which, according to the participants, entail an incentive to study and allow for adequate assessment of what an individual student can do. One of the researchers explains it as follows:

A course in knowledge. The student has acquired some concepts and he [or she] has acquired some techniques and theories and basic ideas. So, he [or she] has to demonstrate back by writing them down for the teacher to really understand them, so that they can know the extent to which they have, uh, grasped the whole concept of the teaching. Yeah, that's that's why I think a written exam will be the best (P8_R).

Oral exams were said to be valuable as they allow students to express themselves more widely than in a written exam. Orals, according to the respondents, often go along with demonstrations and/or presentations. They allow for ample flexibility and fine-tuned interaction. A lecturer explains:

But I think I want to get more things from the student as well, because normally with oral, there's, I mean, the students will have the chance to speak on so many things. So many things with the oral, students will have the chance to speak on so many things. And I think that is yeah, that makes the oral thing a very good one here, because at that point. More things. I mean, the students will get more things from, from different, different angles, put them together and tell us (P1_L).

However, participants also indicated that oral exams take ample time, and with large numbers of students, difficult to implement. One researcher indicated that “because you can't break them into smaller groups and then have uh a more detailed interaction with them. So, it will be difficult to do that” (P7_R).

Continuous assessment is broadly recommended by the participants. In their view, it allows for both formative and summative assessment and can be very varied. It may refer to assignments, exercises or tests depending on the specific course. It is considered to be appropriate as it offers students opportunities to reveal what they have learned at different moments spread over time. As a researcher specifies:

Because it has to be a continuous thing. Um, as you want to see whether they have understood what you have taught them. The practicality is that they must show you. And so doing a written exam, um, one off [time] will not be the best to institute. So, you do it. Piecemeal little by little. This one. We are done with that one. This one. So that you can really find out if you have gotten the understanding of what? (P7_R)

A portfolio is tied to internship but also more broadly advocated for as it allows students to collect evidence of different nature (reports, journals, video, reflections, etc.) collected over a longer time. A researcher explains the appropriateness of a portfolio, to a ‘create/synthesis’ goal, as follows:

And this one too. In fact, I will still go for the portfolio because once it is, they are putting together. If you said you have been able to create something that I want to see what you have created and that will be an evidence that really you have been able to put pieces together and create something new. So, the portfolio will enable me to actually know what they have been able to create. So, I will still go for portfolio (P10_R).

For the respondents, the take-home exam has a clear advantage as students can take longer and use support and external expertise (in books, the internet, with persons). That element of support might, in their view, also have a downside especially if the ambition is to test the learning of an individual student. A researcher expresses it as follows:

You can do the take-home exercise. But you see, uh, the critical element with the take home exercise or continuous assessment is that it needs to be monitored. You need to monitor because when the person takes this home, sometimes they may not do it on their own. They will seek support, they will come and the thing is done properly. But they have not got the, uh, full blown understanding as you want it (P8_R).

Context

Context is a vast area of knowledge with very different aspects. First and foremost, participants often referred to current practices, to what is done when explaining their decisions. References to those practices are not only illustrative, but they also highlight what participants consider appropriate. Current practices are discussed as they represent what participants value. This is illustrated by the following quote from one of the researchers:

Okay for the oral exams. What I know or in our context here, it doesn't happen that much unless maybe a defense like your research defense. If not for the course content and everything, that one will be written. (...) I don't know, maybe over here. Like the written is popularly used (P6_R).

Three components of context seem to belong to the context knowledge area and affect design decisions: curriculum or the nature of the course, the practical environment, and the cultural context. Design decisions are taken in a curricular context that outlines the nature of the course concerning the level of education, the discipline or content of the course, and the orientation of the course. These elements seem to be taken as given, and orient decision making by the participants. A quote by one of the students highlights this:

The reason is we want the student to apply the knowledge he or she has acquired throughout the, uh, education process, let's say in the first degree in the Masters, you want the student to apply the knowledge he has acquired throughout the four year or the three-year course. And so, I'll go for the practical. The practical here is that after completion, you go out and when you go out, you are going to use the knowledge you have gained to solve problems. So, it will be practical. Let's say you have learned the theory aspect in the classroom, but when you go out it is purely practical. So you is, then where you are going to apply. So back in the, in your school days in the university, if it was only theory that you were taught you, you will find it difficult in applying it. But if back in the school days you were taught the theory and then the practical aspect coming to the field, you will find it easy because you have done it back in the school days (P11_S).

The practical environment is argued to affect decision-making. Particularly, the number of students constitutes an important factor to consider in design decisions. Of a similar nature are considerations concerning the availability of resources and/or time. As one of the researchers argues:

Because you can't break them into smaller groups and then have uh a more detailed interaction with them. So, it will be difficult to do that. But if you don't have a large group, the class sizes are smaller, then you don't go in for this one. Yes, but if you have a large class, very large class, and you need to put all of them in one auditorium and then teach (P7_R).

Context is also cultural. While not frequent, mention is made of specific cultural elements that especially relate to an oral tradition and respect for expertise. The apprenticeship model is put forward as closely linked to local culture. A student clearly stated that:

Yeah. Ben, I love how our culture has shaped us, because culture is actually shaping us there. And for we there causally believe that oral and defense can be a good assessment for us. [...] So, we normally assume that orally knowledge will be shared. So, I'll go for oral assessment and defense (P13_S).

Agents

The data revealed that knowledge about two types of agents, students, and lecturers, affects design decision-making by the participants. For students, several cognitive (mastery of subject matter) and affective variables (confidence/fear) determine the amount of support but also the extent to which group discussions are put forward (to avoid students having to speak in

public). Some respondents point to the importance of personalization (especially when it comes to assessment) to accommodate different 'learning styles.' Knowledge about what abilities are needed in relation to actual skills of students results in putting forward specific skills as goals of teaching activities: communication skills, collaboration skills, and teaching skills. One student participant highlighted as follows:

The reason being that when students are put into groups, it is there that the student will come out. Sometimes some feel shy in the classroom may be answering questions or, uh, asking the lecturer question, but once they are put in the group with his [or her] own peers, the person will feel okay to ask any question (P11_S).

A clear insight into students' behavior also plays a role. It relates to what students may be expected to do (e.g., coming to a shared understanding, explaining content to peers) as well as what teachers presume students will do (e.g., consult family members or friends in case of assignments). This knowledge may result in actually putting forward a specific method or approach or, in contrast, avoid the selection of that method or approach. A lecturer explains:

The take home could be. Um. Maybe...., giving them..... An application. Sort of assignment or take home? Yes. Where, they may have to read wide to solve the problem or even consult others at home, could be their parents. It could be people who live in their community. Yes. So that they can, uh, think out of the box and come out with something new (P3_L).

Lecturers are highly regarded by the participants. Respondents select specific methods and/or approaches by considering what lecturers will do. Lecturers' actions mainly pertain to the provision of information (knowledge), to monitor for progress in understanding (and possibly provide additional support) of subject matter or the assignments given. As a lecturer indicates "then I make sure that I go around. If a group is having difficulty with the particular question, then I will assist that particular group. But most of the time they don't tend to call you" (P5_L).

Principles

Participants only rarely referred to theoretical concepts or principles with respect to learning and/or designing learning environments. Concepts that are mentioned by individuals pertain to goals (taxonomy of Bloom), assessment (distinction between formative and summative), students (e.g., the notion of 'learning style'). Some very general principles with respect to learning (active participation, reflection, practice, personalization) and designing (goal dependency) are also mentioned. A researcher, for instance, mentions the principle of practice in the following quote:

And then the more you, you know, you say practice makes perfect, so the more the person continuously do it, then the person will have a full understanding and then expand his view on that. So that's how it's supposed to be (P8_R).

In the arguments of participants, a number of quality standards can be detected. These pertain to the design (e.g., alignment between goals and assessment), and information provision (and especially assessment). With respect to assessment, two categories are prominent. The first one relates to the validity of the assessment. Respondents pointed to the need for assessing relevant goals but also that students themselves are assessed on those goals. This was highlighted by one researcher as follows:

Uh, it should be more of essay questions. Should be questions that will test their understanding. Yeah. So uh, questions that would let you see whether they have really understood what you taught them. Um, it could be, you know, a question that will allow them to choose or select answers that will allow them to produce something for you to see that, oh, this is your own production. This is what. And it will tell you how they have understood what has been taught (P7_R).

The second relates to concerns for the reliability of assessment (concern about the ability of students to express them either orally or in writing) also play a role. As one lecturer puts it:

Um, having done it in groups or individually. And we then like to know how well each student has understood what has been presented. In that case, written, written items, uh, most of the take home assignments, chances are, students don't do it alone. They may seek assistance from their colleagues or people or something, but with written once you are there, or [00:08:30] even oral defense. So that I also ask you questions to know how well you have understood what you are, you are presenting, or what you are being taught (P2_L).

Differences Between Groups of Participants

One of the goals of this study is to determine whether educational researchers, lecturers, and/or students differ in their knowledge about designing. Such differences might help explain issues in instructional design, such as the theory-practice gap and non-compliant behaviors among students. Also, given the varied learning areas (from general/traditional programmes to TVET programmes) in the university where the study was conducted, such variations might explain how different stakeholders (lecturers, researchers and students) understand the unique mandate of the university and how they design, implement, apply, and interpret different instructional design processes and epistemologies.

Contrary to expectations, this study revealed an overall consensus among the different groups of participants regarding what constitutes a powerful learning environment in higher education and the elements to consider when designing such an environment. Generally, for the participants in this study, a powerful learning environment is one in which a lecturer takes significant responsibility for providing information, monitoring and stimulating student understanding through interaction, and assessing at regular intervals to encourage students to take their studies seriously. The tasks in the learning environments are heavily discipline-specific, with some courses being more theoretical and others more practical. There is a high respect for lecturers and, more generally, experts (e.g., during internships). The design assumes that students will support each other in understanding the information provided and completing the assignments. Group work is mobilized as an instrumental design element in fostering understanding among a wide range of students.

While there is a large overall consensus among the different groups of participants, some differences concerning areas of knowledge and their substance were observed, especially among students. Compared to lecturers and educational researchers, students do not refer to some knowledge (sub)areas and highlight others. Students seem to take the educational goals put forward for granted as separate entities, whereas both educational researchers and lecturers stress the similarities and links between the different goals. In terms of teaching methods, students more clearly emphasize the wide usability of recordings, while lecturers and educational researchers mainly regard them as a backup option. Regarding assessment, students particularly point out that ample support from family and friends in the case of take-home assignments may threaten the validity of the assessment. Only students refer to the cultural context when discussing the importance of expertise and the need for ample oral interaction and expression. Similarly, students highlight the contrast between internships and on-campus education concerning the availability of equipment. While all groups acknowledge the importance of individual differences, students especially argue in favor of multiple assessment approaches to allow all students to express themselves and refer to the motivational power of written end-of-term exams. While oral assessment may be preferred as it allows for ample flexibility and interactions, it may be difficult to implement because of the constraints of time and large student numbers.

Discussion

As a contribution to research on instructional design, this study used a design-task approach to explore the design epistemology of educational researchers, lecturers, and students in Ghana. The study revealed six areas of knowledge: goals, teaching methods, assessment approaches, context, agents, and principles. Participants' conception of the elements in each of these areas strongly affects their design decision-making. A few elements are striking. In contrast to expectations, the study largely indicates that while there are some specifics with respect to the substance of knowledge areas, overall, the design epistemology of educational researchers, lecturers, and students is very similar both in terms of areas of knowledge and the substance in those areas. The most striking observation relates to the consensus among different groups. This consensus can

be illustrated by what very different (different roles, different genders, different disciplines/programs) participants highlight as common and good practice. For example, participants considered a well-structured lecture by an informed lecturer followed by in-group discussions about the information provided in order to come to a shared understanding of that information as good practice. It seems that all participants, irrespective of the group to which they belong and the role they have when it comes to designing, share an instructional template about what elements in a learning environment enhance the probability that students will actually learn. In that instructional template, a huge responsibility is given to the lecturer while at the same time, the group of students is seen as powerful when it comes to promoting learning and understanding. The study also demonstrates that the presence of the lecturer in the classroom is regarded to be critical for students' understanding. The central role of lecturers in enhancing students' understanding may be contrary to the general contemporary belief and practice in Western higher education institutions where seminar and other forms of engagement are deemed the most preferred forms of students' activation and participation in learning activities. There is a common argument mostly within Western higher education literature that students learn more and/or better by active forms of instruction (e.g., seminar) than through didactical forms of engagement such as lecture method (e.g., Freeman et al., 2014; Geven & Attard, 2012). However, others have argued that the lecture is not passive, and a student-centered education is not dismissive of traditional lecture method of instruction (Opdal, 2022). Overall, the design epistemology of educational researchers, lecturers and students seems to align with the classical cognitive view of Gagné (1985) that 'nine events of instruction' (gain attention, inform learners of objectives, stimulate recall of prior learning, present the content, providing learning guidance, eliciting performance, provide feedback, assess performance, and enhancing retention and transfer) are essential in any designed learning environment. At the same time, the design epistemology of participants cannot be labelled as 'teacher-centered' given that all the groups also stressed the importance of students' activation and participation in the process and the shared responsibility for effective instruction and learning. This point of view has also been highlighted by Boud and Prosser (1980) as important especially in higher education and professional education. It should be said that when students listen to a lecture, though they may be inactive behaviorally, cognitively they question, analyze, critique and evaluate the information being delivered by a lecturer (Opdal, 2022). Thus, behavioral inactivity can be compatible with cognitive activity of students in an instructional setting, and ultimately, cognitive activity of students is what is most important in a learning environment (Opdal, 2022). This important element illustrates the contextual nature of understanding instructional design models.

The presence of a shared instructional template turns the design task into a development task. Rather than designing a learning environment from scratch, participants consider what teaching methods and assessment approaches are most appropriate given (a) the instructional template and (b) their understanding of the practice as it currently is in that particular context. Based on those consideration participants select appropriate teaching methods and assessment approaches for the educational goal at hand and specify how these methods and approaches may look like. The participants in the present study had clear understanding of the requirement of specific design knowledge (intended educational goal) for teaching approaches and assessment practices in a way that speaks to their appreciation of constructive alignment (Biggs & Tangs, 2007). Constructive alignment describes the interconnectedness among intended learning outcomes, teaching and learning activities and assessment (Biggs, 1996; Biggs & Tangs, 2007). The task is not seen as an invitation to analyze the goal and the context but as a task to deliver education. This seems to reveal an important feature of ID practice, which is that in most cases, learning environments have a history and are not designed from scratch. Rather, ID practice in a lot of cases is a re-design practice. While not regularly mentioned in the classical ID literature, this feature gradually gets more research attention. ABC learning (Young & Perovic, 2016), for instance, is proposed as an approach to (re-)design blended and on-line learning courses. From a different perspective, Könings and colleagues (2011) have invested a lot in research on redesigning to more explicitly consider the viewpoints of students.

Findings, then, at least suggest that the widespread commonalities with respect to areas of knowledge and consensus with respect to optimal designs of learning environments result from an instructional template, an unquestioned structure of educational practices within the particular context of the study. The implication of this finding is that, despite the different learning areas from which the participants were selected, there were no marked differences in their design epistemology, at least in terms of how they talked about them. The similar design epistemology between TVET and other traditional learning areas could be due to several contextual factors, such as the structure of the Ghanaian higher educational system and

availability of human and material resources. In the Ghanaian educational system, like many others elsewhere, curricula have to be accredited and thus requires that lecturers usually prepare their instructions according to a highly pre-structured context and framework (instructional template), such as approved or accredited program document from accreditation bodies in Ghana. As has been long noted, such instructional template or curriculum framework reflects a shared 'grammar of schooling' (Tyack & Tobin, 1994) which is very resistant to change. The required curriculum framework, if applied without flexibility, could determine the design of all learning environments and reshape any design task into an elaboration or development task. The impact of such curriculum framework might be explained by the context in which participants operate. For example, in addition to lecturers preparing their education in a highly pre-structured context and in line with accredited curricula and specifications in terms of goals, content, and overall approach for teaching and assessment, other, specific institutional rules (e.g., pre-internship, internship, and post-internship activities) have to be complied with. In the higher education context of many universities in Ghana, assessment practices are already pre-specified so that an obligatory end-of-term exam accounts for 60% whereas continuous assessment (which can take different forms) account for 40%. This does not leave much room for flexibility in assessment design practices. This important finding suggests that the effectiveness of instructional design may not only get affected by cultural aspects of context but also by structural aspects of contexts. The structure within which instructional design practitioners operate affects the extent to which they can operate as well as the extent to which they can make design decisions. The impact of such structures can only be revealed by studying ID practices in multiple contexts. For this particular case, the results suggest that the endorsement of an instructional template through educational policy structures and processes has important implications. First and foremost, the instructional template makes systematic instructional design obsolete as only a specific design of the learning environment gets approved and accredited. It is within the context of that design framework that lecturers can develop (rather than design) learning environments for their students. While this might be appropriate in ensuring basic educational quality, it may also preclude that the learning environments offered to students suit their individual needs, the specific disciplines and the specific educational setting. The findings also suggest an interesting implication for the epistemology of researchers, lecturers and students. At the core of that epistemology is the instructional template which is broadly shared. Further research is needed to investigate whether such a shared instructional template reduces the impact of the issues that affect the effectiveness of ID in specific contexts. For instance, is the prevalence of instructional disobedience lower given the shared design epistemology?

With respect to the issues that were said to affect the effectiveness of ID, this study at least suggests a strong theory-practice gap. While in ID models' clear distinctions are made between educational goals, in the specific context of the present study, these distinctions do not seem to be relevant. At least, the terminology used to describe educational goals does not seem to align with the thinking of the participants in this study. Moreover, practice rather than theoretical principles seem to guide design decision-making. It emphasizes the view that designing is a highly situated activity, a view supported by the proponents of the Activity-Centred Analysis and Design Framework (Goodyear et al., 2021). Given the context-specificity of instructional models and decisions, it is suggested that ID experts and policy makers in Ghana should work collaboratively to adapt existing ID models and/or develop new culturally responsive ID models to teach different disciplines to promote the achievement of modern aims of higher education in Ghana. While this study reveals a number of interesting findings, it aims not at making conclusions. Further research on design is definitely needed to explore for example, the influence of shared curriculum framework for higher education institutions in Ghana. From a methodological point of view, the findings of the study may have been influenced by the specific methodological approaches used. For example, the design task itself and especially the presentation of vignettes with teaching methods, assessment approaches and educational goals may have provided a structure within which participants had to work and may have resulted in the identification of specific knowledge areas. The use of other less pre-structured methodological approaches to detect design epistemology may help to corroborate the findings.

The results clearly present a call for more research on actual and situated design practices or design praxiology in the words of Goodyear (2000). Such research may help to better understand context-specific structural and cultural factors that affect the practices of ID practitioners and provide emic perspectives of effective instructional design models. Such studies may also corroborate the present finding that the importance of instructional goals is not always acknowledged by lecturers and

students. Findings from such research may help to elaborate new or to fine-tune existing ID models so as to facilitate their actual use and effectiveness in non-Western higher education contexts.

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