Exploring the long-term impact of three short instructional development programs on instructional models for university teachers

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Abstract: In the last decades, the number of instructional development programs for university teachers are increasing across the world. Consequently, many research studies aim to indentify the impact of these programs on teaching effectiveness in higher education. Despite the number of studies, many research questions have not received yet conclusive responses. In this context, the present paper presents some evidence about the long-term effect of three short instructional development programs that have used instructional models as educational content (*Gagné's instructional model*, *Gagné's Adapted instructional model* and *Engelmann's Direct instructional model*). After three years from the implementation of programs, a semi-structured interviews was conducted. Out of the 12 teachers involved in the programs, 9 expressed their willingness to respond. The results show that all the 9 teachers have used in their current teaching practice, in a adapted form, many of the aspects acquired during the programs. Also, the results highlighted that instructional models are perceived by the university teachers as tools with greater applicability for teaching in higher education. The results are discussed and some possible implication for the filed are presented.

Key words: higher education; instructional development programs; instructional models; medical universities, long-term impact.

1. Introduction

In the past decades, a lot of effort has been invested to investigate the impact of instructional development programs (IDPs) for university teachers on teaching effectiveness in higher education (De Rijdt et al. 2013; Steinert et al. 2016; Stes et al. 2010). Generally, these studies have used adapted the version of the Kirkpatrick's (1994) model for evaluating outcomes of IDPs (Steinert et al. 2006; Stes et al. 2010). For example, Stes and her collaborators (Stes et al. 2010) presented a model with three levels (*change within teachers*, *institutional impact*, and *change within students*). Each of these three levels has some dimensions. *Change within teachers* is referred to change in teachers' attitudes, conceptions, knowledge, skills and behavior. *Institutional impact* takes in consideration changes in the organizational, attributable to the IDPs. Also, *change within students*, considered the following aspects:

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students' perceptions, study approaches and learning outcomes (Stes et al. 2010, p. 29). It seems that most of the studies in the field are focused mainly on the first issue (Steinert et al. 2016). Even if the change within teachers it seems to be the most analyzed outcome of IDPs, the long-term impacts of such programs remain an aspect less studied (Stes et al. 2010). Also, most of the studies have evaluated the impact of IDPs as a whole. For which reason exploring the impact of the amount of training time spent (De Rijdt et al. 2013; Stes et al. 2010) or theoretical foundation (Amundsen and Wilson 2012) of IDPs could be also useful in order to increase the knowledge about these programs and their impact on teaching effectiveness in higher education.

This study aims to present some evidences in order to fill these gaps. A qualitative research approach is adopted to evaluate the long-term impact of three short IDPs (two hours of training each program) with instructional models (*Gagné's instructional model*, *Gagné's Adapted instructional model* and *Engelmann's Direct instructional model*) as educational content. A semi-structured interviews instrument was used to collect the participants' answers. The research was conducted three years after the programs.

2. Conclusions from the exploration of previous studies in the filed

Usually, if the amount of training time spent is considered, IDPs are divided into *one-time events and extended over-time events* (Rijdt et al. 2013; Stes et al. 2010). In the most recent review in the field (Steinert et al. 2016), out of the 111 studies analyzed, 32 are presented as one-time events. This type of program is described as interventions ranging in duration from one hour to six days. In previous reviews, the same type of IDPs is described slightly differently. For example, Stes and her collaborators understand from one-time events that programs from 2 hours to 4.5 days (Stes et al. 2010). Also, Rijdt and her collaborators (Rijdt et al. 2013) present one-time events as program from one hour/one day to two consecutive days. Maybe, this inconsistence in the field can be explained by the fact that many studies have used different terms to report the amount of training time spent. Some article do not present data (e.g., Addy and Blanchard 2010; Stepp-Greany 2004 etc.), other use years (e.g., Howland and Wedman 2004; McClusky de Swart 2010 etc.), or months (e.g., Cilliers and Herman 2010; Persellin and Goodrick 2010 etc.), or weeks (e.g., McShannon and Hynes 2005; Sydow 1998 etc.), or days (e.g., O'Hara and Pritchard 2008) and small minority use ECTS (e.g., Postareff et al. 2007; Postareff et al. 2008) to present the amount of training time. In this context, the present paper used the definition proposed by Rijdt and her collaborators (Rijdt et al. 2013) to explain one-time events/short IDPs. It must be said that previous studies, also, have advanced the idea that one-time events have less change to make a profound impact (Prebble at al. 2004; Saroyan and Trigwell 2015; Stes et al. 2010). However, due to the small number of the studies that evaluated the impact of one-time events, future research on this topic is necessary. Also, an even greater need appears to be the evaluation of the long-term impacts of short IDPs. (Stes et al. 2010).

Three instructional models are the theoretical foundation of the three IDPs (*Gagné's instructional model*, *Gagné's Adapted instructional model* and *Engelmann's Direct instructional model*)

evaluated in this study. Instructional design is one of the central topics of the educational research field. Studies in field have considered empirical research, instructional theory, learning theory and human behaviour (Reiser 2001), proposing important contributions in order to design instructional activities. Among these, instructional design models (IDM) and instructional models (IM) have an essential role.

IDMs are used in university programs dedicated to training professionals in instructional design activities in USA and abroad (Driscoll 1994). However, the interest for using them in practice is different from field to field. If in areas such as industry, business and military, the interest for using these models was always high, in public schools and specially in universities *(Reiser 2001),* this interest is at the opposite level. This existing situation could be one of the explanations of education's current limits, highlighted by relatively recent extensive research, too (ex.: Arum and Roksa 2011). IDMs are complex structures that are focusing on the phases of the process of designing an instructional program (analysis, design, development, implementation and evaluation). In the implementation phase, some IDMs are proposing IMs applicable at the lesson level, using a specific set of instructional events. An IM is "a step by step procedure" (Gunter et al. 1995, p. 67), which allows the planning of the lesson steps, using instructional events (Gagné and Brigges 1974; Hunter 1984; Ilie 2014; Magana and Marzano 2014; Dick and Carey 1990). These instructional events were the central concept of three IDPs evaluated in this paper.

In Romania, beyond a summary presentation of several IMs (Iucu 2008), *only the model proposed by Gagné* (Gagné and Brigges 1974) is widely known (Crasovan 2003; Pavelea et. al 2005; Joița 1994) and it is used for lesson design in an adapted form, however substantiated epistemic and empirically only recently (Ilie 2014). This situation is felt in real educational practice at all levels of educational. In pre-university education, most practitioners consider the lesson plan design as a bureaucratic paper (Ilie 2014 et al.). In higher education, excepting the situations when the academic must take part in a didactic competition, lesson plan is not used.

These shortcomings of IMs using in educational practice could be explained by a series of limitations of IMs current approach in the context of the state of the art research in the instructional design field. I am *discussing the following two arguments:*

a) placing the IM as a less important background of the IDM.

In December 2011, without time limitation and using IDM and IM as key terms for a simple research in two of the most relevant journals in the instructional design field, *Educational Technology Research and Development (ETR&D) and British Journal of Educational Technology* (BJET), data confirms this limit. After eliminating the book reviews and studies assigned to both categories, we have found 102 results in ETR&D and 34 in BJET (total = 136) for IDM, and 73 in ETR&D and 46 in BJET (total = 119 results) for IM. If we do a more specific research, taking into account as key term *instructional events* as steps of an IM, then the situation is even clearer: 39 in ETR&D, 12 in BJET, total of 51 results. This reduction in the number of articles related to IM, makes us remind the firm remark of one of the reviewer of an article recently published in ETR&D **(Ilie 2014**), which highlights that although several confusions are made quite often between IDM and IM, a correct presentation of terms requires a clear distinction

between the two concepts. Coming back to our computations, a quick analysis shows us that the ratio between them is around ⅓ for IDM. From another point of view, we can find studies which are making conceptual and comparative analysis of 15 IDMs (Edmonds and al. 1994) or even 40 IDMs (Andrews and Goodson 1980), however we can find quite rarely studies which analyse more than 5 IMs (Magliaro and al. 2005).

b) a relatively low number of empirical data related to IMs and their impact on the instructional design and the teaching effectiveness.

This fact was noted even by Wager since 1978:"at this point there is very little empirical data or research relating to the events of instruction and how they affect the design of instruction" (1978, p.8). Of course, since Wager's observation until nowadays several studies were made in order to fill this gap (ex: Kinzie 2005, Ilie 2014 etc.). However, even the IM of Gagné (Gagné and Brigges 1974), which is the most known and used IM from field (Smith and Ragan 2000), has not been integrated until this moment into a meta-analytic study. Several meta-analysis of the field (Donker et al. 2014; Hattie 2012; McEwan 2014), are rather approaching instructional strategies focused on a specific type of learning strategies such comprehensive reading and writing (Chiu 1998), writing to learn (Bangert-Drowns 2004), cooperative learning (Slavin 1991) etc., than considering an IM as set of instructional events. In the 931 meta-analyzes that Hattie (2012) centralized, he never uses the term of IM, although identify 411 studies, which frames to teaching category. Among these, is even the model *Direct instruction* proposed by Engelmann (1980). Thus, the paper aims to develop the knowledge in the field through the evaluation of the long-term impact of three IMs on university teachers' currently teaching behavior.

3. The three IDPs with instructional models as content

Gagné's; *Gagné's Adapted* and *Engelmann's* were selected as instructional content of three short/one-time IDPs. The instructional events of these models were the main concept of the three IDPs. These choices were based on sound arguments. *Gagné's instructional model* is one of the most influential and used IMs (Christensen and Osguthorpe 2004). *Gagné's Adapted instructional model* is the most widely known in the Romanian educational context (Ilie 2014). Also, *Engelmann's Direct instructional model* is one of the few for which the effect size (d=.59) of its impact on student achievement has been calculated (Hattie 2012). Each of the three training sessions has two hours of instruction. The following steps are included in each program: first, short presentation of the history of the instructional model; second, presentation of the instructional events of the model; third, examples of how the model can be applied; and fourth, examples of how a lesson plan is developed using the model. Also, the specific correlation of the following four instructional elements is considered: learning objectives, instructional content, instructional methods and assessment methods elements (Anderson and Faust 1973). Moreover, in the training sessions, the trainer paid particular attention to the following: a) balance between explanation and interaction; b) balance between theoretical aspects and application; c) developing an experience exchange environment; and d) taking into account the participants' instructional needs (De Rijdt et al 2016). Each of participating university teachers

were asked to teach three lessons to their classes following these specific steps: a) participate in the first training program on Gagné's model; b) develop a lesson plan using Gagné's model; c) teach a lesson using the lesson plan based on Gagné's model; d) participate in the second training program on Gagné's Adapted model; e) develop a lesson plan using Gagné's Adapted model; f) teach a lesson using the lesson plan based on Gagné's Adapted model; g) participate in the third training program on Engelmann's model; h) develop a lesson plan using Engelmann's model; i) teach a lesson using the lesson plan based on Engelmann's model.

4. The present study

4.1 Aims and hypotheses

The present study investigates the long-term impact of three short IDPs on teachers' currently instructional behavior. The three IDPs evaluated have used three IMs as educational content. After three years to the implementation of the programs, a quantitative research approach is used to collect data from the participants.

The aim of the study is to contribute to the development of knowledge about IDPs for university teachers and their impact on teachers' instructional practice in higher education. The research question and hypothesis are the following:

Do short IDPs of two hours with one IM as instructional content and delivered to in-service university teachers have a long-term impact on teachers' instructional practice in higher education?

This study hypothesizes that short IDPs that have used IMs as educational content can have positive long-term impact on teachers' currently instructional behavior. This hypothesis is based on previous studies on long-term impact of IDPs in medical university context (Dennick 2003; Gozu et al. 2008; Knight et al. 2005, 2007; Malling et al. 2007; Sisson and Kern 2008).

4.2 Participants, measures and procedure

Between November and December 2013, 108 university teachers from "Victor Babes" University of Medicine and Pharmacy, Timișoara, Romania, were enrolled in a pedagogical program offered by Teacher Training Department of West University of Timișoara. Out of these 108 participants, 20 expressed their willingness to participate in an experimental program that would test if a short training, with specific instructional content (IMs), can have a positive impact on their teaching effectiveness. This program is presented in the above section called *The three IDPs with instructional models as content*. The other 88 chose an alternative program that had curriculum development models as content. At the end, out of these 20 participants, 11 completed their tasks and another one taught only three lessons. For various reasons the other 8 could not complete their tasks. Thus, out of the 20 academics, only 12 finalized the programs.

In order to explore in a quantitative approach the long-term impact of these programs, in November 2016 a semi-structured interview tool was developed. The main questions of this tool were the following:

(1) *Why have you chosen the IDPs with IMs as instructional content and not the other one*?

(2) *Are IMs utile tools for increase the teaching effectiveness in higher education*?

(3) *Have you use in your current instructional activities IMs*? *Please give some examples*?

(4) *If in this moment do you have the opportunity of a complex IDPs dedicated to IMs, do you decide to participate*? *Why*?

In the first decade of November 2016, all 12 participants that finalized the programs received one e-mail from the author of this paper. Also, the author of this study was the trainer of the three IDPs. Through the e-mail, the author of this paper invited the academics to participate at the interview and present the four above questions. The participant could choose to response using the e-mail or by phone. After, this out of the 12 university teachers, 3 replied in writing via e-mail. Another 6 accept to response by phone, and the remaining three could not be contacted. Each interview took about 15 - 20 minutes. For each question, the researcher wrote the participants' answer and, after that, ask if they agree those notes.

5. Results

Out of the 9 university teachers, 8 were female. Also the teachers have different staff grades: one associate professor, one lecturer and 7 university assistants; and different lengths of service as university teachers (from 1 to 15 years). The technique of text analysis was used to interpret the participants' answer.

The answers of the first question highlight two different type of motivation to choose the instructional programs with IMs as educational content. First, the programs have been chosen because it seemed to have greater level of applicability. Out of the 9 participants, 7 gave an answer in this direction. Please see below some examples.

It appeared a theme with greater applicability (teacher no. 1).

It was my first year of teaching and I wanted to experiment these IMs. Also, it was the most appropriate to my main activities from that moment (teacher no. 5).

I choose IMs because I had very little information about it and I wanted to see if it has impact on practice (teacher no. 8).

Another type of answer (at the first question) highlighted that the task was perceived as an easier task and also more applicable. Out of the 9 participants, 2 gave an answer in this direction.

It seemed to be easier (teacher no. 2).

It seemed to be easier, but also more efficient. I wanted to increase the level of my teaching activity, I felt that I had gaps in this regard (teacher no. 6).

All the answers to the second questions highlighted that the university teachers have perceived the IMs as useful or very useful tools for increase their teaching effectiveness. Please see below three examples to sustain this position.

I think the models can be useful (teacher no. 5).

For me, yes! I think that the models are useful ... I think at the models when I teach (teacher no. 6).

The IMs were useful for me. I used its immediately in my teaching activities (teacher no. 7).

At the third questions, all the participants have said that use the models in their educational practice. The answers can be presented in two categories. The first includes those that used the correct terms to present the instructional events of the IMs (5 answers), and the second those that cannot be used the correct terminology but can present a well description of the instructional events (4 answers). We present below some examples.

Yes, specifically Gaining attention and Final appreciation (I neglected these aspects before the IDPs) (teacher no. 4).

Yes. Currently, I do not start any teaching activity without Gaining attention and explain why is necessary to acquire the new knowledge. Also, I not finish any teaching activity without questions for students about the new knowledge. Always, I let time to see if they have learned the new knowledge and, if are necessary, to give some new explications (teacher no. 8).

Yes, I have use IMs in my activities. It's difficult to present these now using the specific terminology. For example, at the beginning of the lesson, I always tell to the students the specific title of the lesson and, also, what I expect them to know at the end of the course (teacher no. 7).

Five different type of answers have highlighted at the four questions. Generally, out of the 9 answers, 8 express teachers' interest to participate to similar programs in the future. Only one said he is not interested because is focused on research.

I am focused on research, I believe I would not choose a course of pedagogical training, regardless of instructional content (teacher no. 2).

Out of the 8 positive answers, three have linked the participation to the amount of training time necessary to spent.

I would be interested, but it's hard with my schedule (teacher no. 1).

Yes, depending on the time available (teacher no. 3).

Out of the positive responses, another three present unconditional positions. The three university teachers are interested in participating in future to similar IDPs.

Yes, why not! No, the amount of time necessary doesn't matter. I liked very much the programs (teacher no. 7).

Yes, Yes, Yes! I believe that a lesson plan is not enough and if we had more knowledge, we can make better lessons (teacher no. 8).

The last two responses link the participation of academics in IDPs to who is the trainer or to the level of applicability at the medical educational current practice.

It would be interesting, but if it would take more into account the particularities of our university. (teacher no. 4).

Yes, of course but depends on who is the trainer and also from my schedule (teacher no. 6).

The answers of all four questions have highlighted some additionally and interesting results. One teacher would recommend the IDPs to others colleagues. One participant sustain that these IDPs are more useful at the onset of

the career. Another highlighted her surprise because the students have realized that her manner of teaching has changed.

Yes, I think it useful, I would recommend others to participate (teacher no. 1).

It would be extremely useful, but at the onset of the university teaching professional career ... after 10 years of teaching, I found that I have respect some aspects of IMs, obviously without knowing of their existence ... (teacher no. 4).

To my surprise, the students have realized that my manner of teaching has changed (teacher no. 8).

No, the amount of time necessary doesn't matter, but is important to be in the week, not in weekend and also to match my schedule (teacher no. 6).

I would be interested, but it's hard with my schedule. So, short IDPs would be better. If this program will be made during the week (not in weekend and not in the evening) it would be great. I think that the students' assessment period it is more suitable period. In this period, we have a less busy schedule. It would be better that those course be mandatory as ours, I came reticent, but I learned a lot (teacher no. 6).

6. Conclusions and discussion

The present study reports positive long-time impact of one-time events with IMs as educational content on university teachers' instructional approach. The results are in line with previous studies on which we based our research hypothesis (e.g., Dennick 2003; Gozu et al. 2008; Knight et al. 2005, 2007). Also, the results are in line with previous studies on one-time events impact (e.g., Dixon and Scott 2003; Kahn and Pred 2002; Sydow 1998). From another point of view, the results are in line with previous research that highlighted the impact of IMs in higher education (Hampton and Reiser 2004; Hardré 2003; Hoogveld et al. 2005; Ilie 2014).

Due to the qualitative research approach an additionally set of interesting data is highlighted of the study. The great level of applicability of the IMs is a good reason for the university teachers to choose IDPs if its included IMs as content. Also, the ease which these models can be studied it seems to be an additional reason for university teachers to choose IDPs dedicated to IMs. These results seem to be in accordance with principles of adult learning (Paloș et al. 2007). So, because university teachers are adult learners, in designing IDPs one must use specific instructional content which is related to concrete needs in the daily work of university teachers (Opfer and Pedder 2011).

From another point of view, it seems that the amount of training time spent is important for university teachers, but more important it seems to be that the schedule of the IDPs matches with teachers' schedule. Also, because the medical teachers' schedule is overcrowded (these people are, in the same time, doctors, researchers and teachers) they dedicate the weekend time to the family. Consequently, the students' assessment period it is more suitable period to implement one-time events/short IDPs in medical university settings. Also, because the medical academics see themselves first as doctors or as researchers and only in the end as teachers (Stenfors-

Hayes et al. 2010) it seems that mandatory IDPs are more efficient to determinate the participation of medical university teachers in IDPs.

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