MULTIMEDIA IN PRESCHOOL: AN ADDITIONAL OPPORTUNITY TOWARDS EQUAL OPPORTUNITIES IN EDUCATION

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Abstract

The objectives of this practice-based project are threefold. Firstly, it investigates how multimedia literacy of preschool children (3 to 5 year olds) can be stimulated. Secondly, it aims at understanding the influence of multimedia literacy on their world exploration. Do children exhibit a higher level of wellbeing, involvement, active language skills, social competence, self-regulation, creativity and artistic expression while exploring the world? Thirdly, the potential of multimedia to support the children's personal development is assessed, with particular emphasis on young children with extra needs. The results show that the creativity of children on average is growing when they have the possibility to explore the world using audio-visual materials. Furthermore, the research shows that children with externalizing behaviour benefit from audio-visual input. They demonstrate a higher wellbeing and involvement. On the other hand the wellbeing of children with internalizing behaviour will benefit from additional teacher support.

Keywords: preschool, multimedia literacy, practice-based research project, audio-visual material, internalizing/externalizing behaviour

1   INTRODUCTION

The world today is very different from the one in which educators grew up. For the present generation of children (digital natives) electronic devices are evident. The dominance of language literacy has disappeared; society becomes ever more 'multimedia-rich' [1]. Education needs to adapt to this changing environment [2, 3]. In line to Bottelberghs (2010) [4], the project focuses on the **creative processes** and the **development of talents** achievable by using a multimedia setting, not on the technology of audio-visual materials. As young children use different media (including audio-visual means) throughout their education, they discover and develop their communication skills.

2   MULTIMEDIA LITERACY IN PRESCHOOL

2.1   Multimedia as a means of communication for children

We live in a full screen environment. Images and sounds increasingly determine our lives: in the street, in stores, on television, in movies, in newspapers and magazines, but also on the computer, the game console, mobile phone, iPod, iPad, … Yet, we still think and act from a 'literary' tradition. [5] Our perspective on images and sounds in education is often limited. At school, images are mainly used in a illustrative way rather than as a medium for children **to express themselves and communicate**. We approach sounds in the same way. Sounds are often parts of songs and games. In this way they function as illustrations rather than as means for interactive listening and communication.

We want to let go of the idea that multimedia is a purely technical matter (and consequently also of the notion that mostly technical competencies in handling multimedia should be paramount in education). In our view multimedia literacy is a new culture in which we facilitate children to express themselves an create something new through different media, including the new ones [6]. This will stimulate their talents and communication skills which in turn helps them to explore the(ir) world [7].

2.2   Multimedia literacy a task for education in preschool

Children need to discover their talents by manipulating and exploring various materials (clay, face painting, pencils, paint, costumes, recorders, video camera, camera, voice recorder, … : multi-media, multi-materials). These all contribute to children developing their communication skills, expression and talents. However we believe that currently some of the materials/media (specifically the more focused audio-visual materials) are still insufficiently integrated in preschool. Since there is a lack of audio-visual materials in most classrooms, our focus in this practitioner research is on '**audio-visual learning'** and more specifically on sound and image. The audio-visual component is not a goal as such, but a **means.** The multimedia setting is a way to explore the world, and to develop creative processes, talents and communication skills.

3   RESEARCH STRATEGY

3.1   Well-considered multimedia setting

3.1.1   Design of the critical multimedia setting

The critical media setting is **a quiet area** in the classroom where children can explore the different audio-visual materials (recorders, video camera, camcorder, camera, CD player with headset, voice recorder, laptops, suitcase with items/gadgets to create 'sounds', beamer, dictaphone, overhead projector, but no music and no music instruments, …) and discover its possibilities. Children can do this very independently. Activities in this area focus on direct/conscious listening/watching, expression and communication.

By building the setting in a designated quiet area of the classroom we were able to make video recordings of the children and use these recordings afterwards for observation purposes.

3.1.2   Criteria for good practices

The primary objective for the selected activities in this area is to support young children in their emergent media literacy. Therefore good practices consider following objectives [7]:

1. Audio-visual activities should give children a large period of time to **discover and experience** the possibilities of the materials autonomously. Allowing young children to create their own sounds and images gives them a better view on audio-visual creations.

2. Audio-visual materials are always used as means to help children discover and explore the world in order to develop an active role in media literacy. Audio-visual education in schools must be more than the use of audio-visual media for illustration. Activities should allow children to use different audio-visual **means to express themselves and to communicate**.

3. In education, appropriate attention should be given to developing skills that help children to 'read' images and sounds. In activities children must get the opportunity to reflect on sounds and images (media), so they can discover the difference between the real world and the depiction of that world: **importance of reflection.**

4. Audio-visual training in education should not be limited to a merely technical use of dealing with audio-visual media. Teachers should use audio-visual means as a way to explore the world so that young children discover the link between their audio-visual creations and their own environment. The **emphasis is on the process rather than on the product**. It helps children grow up to be active participants in media.

5. Good practices help children to **consciously listen** to sounds and **consciously look at** very simple audio-visual messages.

3.1.3   First try-outs of the multimedia setting

During a four week initial test phase graduating student teachers participated in a 'multimedia corner' in the classroom. They offered a set of different 'multimedia-rich' activities to a group of children at risk.

In these rich activities children are stimulated to listen very carefully, to become aware, to explore, to establish and to communicate. We noticed that even though the children are quite young, they are very handy and careful with the audio-visual materials.

In this multimedia setting the competencies of young children were observed. Some children at risk do well in exploring these materials and exhibit a high level on the process variables wellbeing and involvement, as well as on other competencies like active language skills, social competence, self-regulation, creativity, artistic expression and handling audio-visual materials. At first glance these observations indicated a positive evolution on different competences. Nevertheless the question arose whether this was caused by the presence of an extra teacher in the classroom, by the offer of audio-visual materials, or by a combination of both.

3.2   Research strategy

To distinguish the impact of the audio-visual material versus the presence of an extra teacher in the classroom, we designed a cross case observation method. In the **observation design** we also took the following facts into consideration:

- This study is performed with **student teachers** in the role of extra teacher. Each year new final year student teachers participate in this project. It takes a lot of time to immerse these newcomers in the multimedia literate world. Each student teacher also has his own leadership style. To minimize this problem we will work with written **protocols**: for every instance of observation the student teacher and class teacher have to follow the same steps and give the same guidance to the children during the different activities.

- This project works with very **young** children (3 till 5 year olds). Each child develops differently. There is no time and money to organise long term research project. We also want to see whether children at risk experience more or less support when audio-visual materials to communicate and express themselves are offered. To solve this problem we try to select children with the same profiles based on the **TRF** (Teacher Report Form) [8] and **CBCL** (Children Behaviour Checklist) [9]

- Because TRF en CBCL only score some of children's characteristics, we used **qualitative observation lists** (see below) to have a more holistic view on the behaviour of the children.

- Because not al CBCL forms are returned, the clinical scores are calculated using only the TRF. Based on the TRF scores and the observations children with either externalized or internalized behaviour were selected.

- To see whether the effect of offering more 'multimedia-rich' activities also lasts longer than the duration of the activities themselves, we used both **short** and **long-term measurements**.

These considerations led us to the research design shown in Fig.1.

4   RESULTS

4.1   Validated and reliable observation method

During the first year of this research, a firstersion of an **observation instrument** for skills and talents of young children was composed. The underlying framework focuses on the following aspects: wellbeing, involvement, entrepreneurship, language, art education and audio-visual work and was based on different documents [10,11,12,13,14]. A first try-out of the observation instrument showed that not all **variables** were easy to score. Especially the linguistic variable, entrepreneurial, artistic education and audio-visual work offered difficulties. This was caused by three factors: first, the list of items did not include all variables sufficiently and we noticed some variables were not really integrated; second, the behavioural indicators for each variable were not sufficiently decrypted and; third, we realized that the guidance of the teacher in the 'multimedia-rich' activities was very strong so there was not enough freedom for children to be able to take initiative in exploring. Moreover, observing and scoring the different variables proved very time consuming.

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
WHAT	TRF and CBCL	**Pre-measurement using protocols** These measurements are analysed using qualitative observation lists	**Intervention using cross design** Condition 1: - Without extra teacher - Without audio-visual input Condition 2: - Without extra teacher - With audio-visual input Condition 3: - With extra teacher - Without audio-visual input Condition 4: - With extra teacher - With audio-visual input In each condition we follow: - 8 children of 3 years old: 5 at risk and 3 control - 8 children of 5 years old: 5 at risk and 3 control (children at risk are selected in step 1) Holistic video analysis will be used to score wellbeing, involvement, ... during activities	**Short-term observation using protocols** These measurements are analysed using qualitative observation lists, TRF and CBCL	**Long-term observation using protocols** These measurements are analysed using qualitative observation lists, TRF and CBCL
WHY	To select children with same profile	To score the starting competencies of the selected children	Intervention in different classrooms to see the impact of audio-visual materials and extra teacher in different conditions.	To see the short-term influence of the intervention on the behaviour (qualitative and quantitative)	To see the long-term influence of the intervention on the behaviour (qualitative and quantitative)
WHEN	October 2011	November 2011	3 to 4 weeks between January and April depending on internship of students	Just after last intervention	2 months after last intervention

Fig. 1: Research design

To meet these shortcomings, we developed a second version of the instrument. This new observation list is mainly based on Laevers (2006) 'Monitoring system for a process-oriented analysis of learning situations in education' [15]. This observation system includes wellbeing, involvement, active language skills, social competence, self-regulation and creativity. We added the topic 'artistic expression. For all these variables we formulated specific **behavioural indicators**. For these descriptions, we used the document "*Procesgericht kindvolgsysteem voor kleuters. Toelichting bij de competenties*" (Laevers, 2001) [16] as starting point.

To verify the **reliability** and the **usefulness** of the instrument, children were observed and scored on the aforementioned competencies by different observers. In a first phase, eight observers (six student teachers and two researchers) scored a selected child independently on the mentioned variables. Afterwards observers discussed the individual scores given in order to achieve a compromise score. In a second phase, groups of two or three observers scored other children. All these scores were statistically processed. Both the reliability of the scores on the different variables and the reliability of the individual observers were analysed. The reliability of the two researchers is good (intra class correlation >.67). In a third phase, the already observed video clips were scored again by the two researchers to confirm or reconsider the compromised score of each variable. This score is the ultimate expert score.

Fig. 2 shows a screenshot of one topic in the observation instrument.

Creativity				
- *Can think of original ideas for possible targets and initiatives* - *Put resources and materials to optimal goals / initiatives to achieve* - *…*				
1	*2*	*3*	*4*	*5*
Level 1: Very low level *Competence is far below the average level of peers.* *Does not choose to work with new unknown to him/her materials. The choice of materials is tedious and not always effective for the intended purpose. Looks at the work of the teacher or other children without their own inspiration to speak. …* **Level 5: Very high level** *Competence is far above the average level of peers.* *Uses new and unfamiliar material independently on a unique and inventive way. Uses a variety of materials and is able to use them effectively to reach the intended goal. …*				

Fig. 2: A screenshot of one topic in the observation instrument

As mentioned in fig.1 we distinguished 4 conditions. In each condition there was one class of 3 year old children and one class of 5 year old children. However, in two conditions one class dropped out because of the lack of the TRF and CBCL-scores. In condition 1 it concerns a class of 3 year old children (without extra teacher, without audio-visual input); in condition 4 it concerns 5 year old children (without extra teacher, with audio-visual input). In each class 8 children were selected: 5 at risk (externalized or internalized problem behaviour) and 3 control children. The competencies of these children were measured on three moments (pre-, short-term and long-term observation) using the observation list mentioned above. Because some children were absent on some measurement moments, a total of 115 observations were gathered. During each observation the process variables wellbeing and involvement were scored during 2 short periods and the competencies (output variables): active language skills, social competence, self-regulation, creativity, and artistic expression, were scored once over the whole measurement to achieve the expert scores.

We first examined whether there is a main effect of age (3 or 5 year olds) to each of the output variables. This was not the case. In the observation instrument the comparison with the standard age is anchored. In the analyses we do not continue to control for the effect of age.

In table 1 the correlation coefficients between the different scores of wellbeing and involvement are displayed. The intra-correlation coefficients of wellbeing and involvement are high, respectively $r=.72^{***}$ and $r=.68^{***}$. The intra-correlation coefficients are also higher than the inter-correlation coefficients and indicate that the used observation instrument is valid.

Table 1: Correlation coefficients between the different scores of involvement and wellbeing

	involvement, score 2	wellbeing, score 1	wellbeing, score 2
involvement, score 1	**.68*****	.61***	.44***
involvement, score 2		.45***	.56***
wellbeing, score 1			**.72*****

*** $p < .001$. ** $p < .01$.* $p < .05$

The correlation between the average score for involvement and the average score for wellbeing is .61 ***. This score indicates the presence of a strong positive correlation between the two variables.

4.2 Consistency between the process and the output variables

Table 2 shows the correlation coefficients between the different variables. They are all significant positive. Five correlations are even more than .60. The presence of (strong) positive correlation means that on average children come to develop when they feel good about themselves.

Table 2: Correlation coefficients between the different variables

	Wellbeing	Language skills	Social competencies	Self-regulation	Creativity	Artistic expression
Involvement	(.61***)	.37***	.42***	**.65*****	**.64***	.50***
Wellbeing		.51***	.53***	.52***	.45***	.46***
Language skills			**.76***	.37***	.34***	.30**
Social competencies				.48***	.39***	.36***
Self-regulation					**.74***	.51***
Creativity						**.75***

*** *p* < .001

4.3 Effect of the different conditions on the different variables

One of the goals of this study was to look to the potential of multimedia to support the children's personal development, with particular emphasis on young children at risk. We want to investigate whether the audio-visual input, with or without the presence of an additional preschool teacher in the classroom, predicts significant growth on the scores of the process and the output variables.

To gain insight, first the effect of both, the audio-visual input and also the presence of an additional preschool teacher, were examined. The combination of both aspects also seems worthwhile to investigate. Furthermore, we wanted to examine whether there is an interaction effect with the measuring time. We expect a significantly higher growth in output variables in the experimental conditions (audio-visual input and / or additional preschool teacher) than in the control conditions (without audio-visual input or additional preschool teacher). The results are shown in Table 3.

Table 3: Effects of the experimental conditions on the variables

n = 115	Effects of audio-visual input			Effects of additional teacher		
	$B(SE)_{time}$	$B(SE)_{input}$	$B(SE)_{time \times input}$	$B(SE)_{time}$	$B(SE)_{teacher}$	$B(SE)_{time \times tea}$
Involvement	.40(.35)	-.71(.70)	.54(.50)	.31(.43)	.90(.74)	-.28(.53)
Wellbeing	-.13(.28)	.08(.58)	.13(.40)	-.38(.34)	-1.03(.60)	.47(.42)
Language skills	.27(.15)	.13(.35)	-.04(.22)	.14(.18)	-.60(.35)	.23(.23)
Social competencies	.10(.15)	.28(.33)	-.10(.22)	.17(.19)	-.16(.34)	-.04(.23)
Self-regulation	.25(.16)	-.17(.35)	.38(.24)	.07(.20)	-.11(.36)	.00(.25)
Creativity	-.11(.14)	-.23(.36)	**.38(.20)°**	.00(.17)	-.74(.35)*	.14(.21)
Artistic expression	-.05(.11)	.12(.26)	.06(.16)	-.09(.14)	-.60(.26)*	.02(.17)

° *p* = .05; *p<.05 [exact: $p_{creativity}$ = .036; $p_{artistic}$ = .018]

The chart above shows that over time there is a slight significant interaction effect of audio-visual input and measuring moment on the output variable creativity. For the output variable self-regulation the interaction effect is just below significant B (SE) = .38 (.24)).

No effect is noticed of the presence of an additional preschool teacher in the classroom. The presence or absence of an additional teacher in preschool has no influence on the increase in the output variables. The focused input, in particular an audio-visual input, is found to be important, especially for the variable creativity.

To clarify the slight significant interaction effect between time and input on creativity, further additional analyses were performed. Table 4 shows that when there is no audio-visual input, there is no significant change on the output variable creativity over time. However if there is audio-visual input, after a period of time significantly more creativity is visible (.27 (.14) *). **When there is an audio-visual input in the classroom during some time, on average the creativity of children grows.**

Table 4: Estimated average score for creativity

	$B(SE)_{time}$	Estimated average score for creativity		
		$M_{pretest}$	$M_{posttest}$	$M_{follow\ up}$
Without input	-.11(.14)	2.30	2.19	2.08
With input	.27(.14)*	2.07	2.34	2.61

*$p < .05$ [exactly: p = .0459]

4.4 Effect of audio-visual input or additional teacher on young children at risk

This study also aimed to look at the potential of multimedia to support children's personal development with particular emphasis on young children at risk. Is the difference in growth on the different variables mainly or only expressed by certain at risk groups of children?

In the selection of children at risk, we focussed on two groups: children with externalizing behaviour and those with internalizing behaviour (TRF clinical score > 60). A second order interaction effect is expected (i.e. time x input x internalizing/externalizing and/or time x teacher x internalizing/ externalizing) because we presumed that the difference in growth in outcome between control (without teacher/without audio-visual input) and experimental conditions (with audio-visual input and/or additional teacher) would be observed mainly or exclusively in certain risk groups of pupils.

In Table 5 the general findings are noted. The B(SE) listed are the $B(SE)_{time\ x\ input\ x\ internalizing/externalizing}$ or $B(SE)_{time\ x\ teacher\ x\ internalizing/externalizing}$.

Table 5: Effects of audio-visual input or additional teacher on children at risk

n = 115	Effects of audio-visual input				Effects of additional teacher			
	TRF, int	TRF, ext	CBCL, int	CBCL, ext	TRF, int	TRF, ext	CBCL, int	CBCL, ext
Involvement	.08(.05)	.15(.07) [2]	.02(.06)	.08(.05)	.04(.05)	.04(.07)	-.06(.09)	.04(.07)
Wellbeing	.07(.04)	.13(.06) [1]	.05(.05)	.07(.04)	.09(.04) [3]	.07(.05)	.09(.08)	.09(.06)
Language skills	-.01(.02)	.01(.03)	-.01(.03)	.01(.02)	.01(.02)	.04(.03)	-.03(.04)	-.02(.03)
Social competencies	-.01(.02)	.01(.03)	.01(.03)	.01(.02)	-.02(.02)	-.01(.03)	-.06(.04)	.00(.03)
Self-regulation	-.03(.02)	-.01(.04)	.00(.03)	.01(.02)	.00(.02)	.01(.03)	-.01(.04)	.01(.03)
Creativity	-.02(.02)	-.01(.03)	.02(.02)	.02(.02)	-.02(.02)	.00(.03)	-.01(.03)	.01(.02)
Artistic expression	-.01(.02)	-.03(.03)	.01(.02)	.01(.02)	-.03(.02)	-.01(.02)	-.04(.03)	-.02(.02)

[1] p = 0.03 – see 4.4.1; [2] p = 0.04 – see 4.4.2; [3] p = 0.04 – see 4.4.3

4.4.1 Significant (second order) interaction time x input with externalizing behaviour (TRF) in the prediction of wellbeing

Table 6 shows the post hoc view of the (first order) interactions between time and input on the wellbeing of children with externalizing behaviour. We see a significant interaction of time and input on the clinical group (with TRF ext > 60). Under this condition (i.e. TRF ext clinical score > 60) the interaction of time is calculated in table 7. This table shows that **children who, according to the teacher, have a high clinical score on externalizing behaviour, benefit from the audio-visual input when their wellbeing is taken as outcome**. Their wellbeing increases (slightly) significantly after the input, while it does not (and even decreases over time, but not significantly) when there is no input.

Table 6: first order interaction between time and input on the wellbeing of children without/with externalizing behaviour

Table 7: Time effect of audio-visual input on the wellbeing of children with high externalizing behaviour

	$B(SE)_{time \times input}$
Trf, ext = 48 (average sample)	-.06(.42)
Trf, ext = 60 (clinical lower)	1.50(.74)*

* p = 0.04

	$B(SE)_{time}$
Without input	-.63(.51)
With input	.88(.55)°

° p = 0.06

4.4.2 Significant (second order) interaction time x input with externalizing behaviour (TRF) in the prediction of involvement

In keeping with previous analysis Table 8 and Table 9 may be made.

Table 8: first order interaction between time and input on the involvement of children without/with externalizing behaviour

Table 9: Time effect of audio-visual input on the involvement of children with high externalizing behaviour

	$B(SE)_{time \times input}$
Trf, ext = 48 (average sample)	.40(.52)
Trf, ext = 60 (clinical lower)	2.22(.93)*

* p = 0.02

	$B(SE)_{time}$
Without input	-.95(.63)
With input	1.27(.68)°

° p = 0.06

The conclusion is parallel with those above, but now for the variable involvement: **the involvement of children with a high clinical score on externalizing behaviour benefits from the audio-visual input when their involvement is taken as outcome.**

4.4.3 Significant (second order) interaction time x additional teacher with internalizing behaviour (TRF) in the prediction of wellbeing

As with previous analyses we found that **there is a slight significant growth in wellbeing for children with high internalizing (TRF) behaviour when there is an additional teacher in the classroom**. This is illustrated in Tables 10 and 11.

Table 10: first order interaction between time and additional teacher on the wellbeing of children

Table 11: Time effect of an additional teacher on the wellbeing of children with

without/with internalizing behaviour   *high internalizing behaviour*

	B(SE)$_{\text{time x teacher}}$		B(SE)$_{\text{time}}$
Trf, int = 45 (average sample)	.42(.41)	Without additional teacher	-.88(.54)
Trf, int = 60 (clinical lower)	1.70(.71)*	With additional teacher	.82(.46)°

* $p = 0.02$ ° $p = 0.08$

5   CONCLUSIONS AND DISCUSSION

5.1   Effects of audio-visual input and/or additional teacher on children's personal development

As conclusion of this study we can say that

- an important task for today's educators is making children **multimedia literate.** In the first place this means stimulating children in active participation by using the new media to express themselves, to develop their talents and to communicate in order to facilitate them exploring the(ir) world. We do not focus on the technical issues but rather on the creative processes, communication skills and talents by using **a multimedia setting.** The multimedia materials are used as **means** (a way to explore the world) and **not as a goal.** Activities should allow children to use different (audio-visual) materials to express themselves and to communicate. The emphasis is on the process, rather than on the product;

- on average the **creativity** of young children **profits** from an **audio-visual input**;

- where it concerns their **involvement and wellbeing**, young children with (according to the teacher) **externalizing** behaviour benefit from audio-visual **input;**

- where it concerns their **wellbeing**, young children with (according to the teacher) **internalizing** behaviour will benefit from an **additional teacher** support**.**

5.2   Implications for policy

To promote the use of audio-visual materials in preschool, more **financial resources** are needed. For schools, audio-visual materials are still quite expensive to purchase. Although young children are very careful with the materials, these objects can always break. This risk can inhibit preschool teachers to (let children) use these audio-visual materials. School **insurance** may have to be reconsidered so more expensive but developmentally rich materials can be used in schools.

Further training for preschool teachers is very important. Indeed, most preschool teachers were not raised in the digital world and need to explore this world and all of its possibilities. Here, as well, the focus should be on the communication process rather than the technical aspect.

REFERENCES

[1] Bottelberghs, P. (2005). Pleidooi voor een filosofie en geschiedenis van de media op de studiedag Audiovisuele media en onderwijs op 17 februari 2005 te Brussel. In *Ambrosia's tafel*. Geraadpleegd 18 mei 2011, http://www.ambrosiastafel.be/Ambrosias_Tafel/Wie_zijn_we_(Paul_-_pleidooi_fil._en_gesch._media).html

[2] Goegebuer, A. (2004). *Audio-visual training in Flemish education.* Gent: IAK vzw.

[3] Vandenbroucke, F. (2005). Toespraak van de Vlaamse minister van Werk, Onderwijs en Vorming Frank Vandenbroucke op de studiedag Audiovisuele media en onderwijs op 17 februari 2005 te

Brussel. In *Beleid Onderwijs en Vorming*. Geraadpleegd 18 mei 2011,
http://www.ond.vlaanderen.be/beleid/toespraak/archief/2005/050217-AudiovisueleMedia.htm

[4] Bottelberghs, P. (2010). Media literacy in education op de Media and Learning conference op 25-26 november 2010 in Brussels.In *Media and learning Brussels 2010*. Geraadpleegd 18 mei 2001,
http://www.media-and-learning.eu/2010/programme.html

[5] Ambrosia's tafel vzw., CANON Cultuurcel, & Vlaamse overheid. (z.d.). *Ingebeeld. Wegwijs in een multimediaal tijdperk*. Geraadpleegd 18 mei 2011,
http://www.platformrondmediawijsheid.be/new/index_flash.jsp

[6] Ambrosia's tafel vzw. (z.d.). Multimediale taal - multimediale blikken. In *Platform rond mediawijsheid*. Geraadpleegd 18 mei 2011, http://www.ingebeeld4.be/new/index_flash.jsp#/336

[7] Mazarese, C., Vanuytven, N., Decin, G., & Buyse, E. (2011). *Multimedia in preschool: An additional opportunity towards equal opportunities in education*. Edulearn-congres, 4-6 juli 2011

[8] Achenbach, T.M. (2004). *Teacher's Report Form (TRF). Gedragsvragenlijst voor kinderen van 1,5-5 jaar, Informatie leerkracht*. ASEBA: Rotterdam.

[9] Achenbach, T.M. (2004). *Child Behavioural Checklist (CBCL). Gedragsvragenlijst voor kinderen van 1,5-5 jaar*. ASEBA: Rotterdam.

[10]Laevers, F., & Depondt, L. (2004). *Ervaringsgericht werken met kleuters in het basisonderwijs*. Leuven: CEGO Publishers.

[11]Laevers, F., Bertrands, E., Declercq, B., & Daems, M. (2004). *Instrumenten voor de screening van kleuters en de observatie van de speel- en leeromgeving*. Leuven: CEGO Publishers.

[12]Van Eyen, C., Verheyden, L., & Kerkhofs, G. (2010). *Taal en KO. Instrumenten voor een integraal taalbeleid in de opleiding Bachelor KleuterOnderwijs*. Leuven: Acco.

[13]Vlaams Ministerie van Onderwijs en Vorming. Agentschap voor Kwaliteitszorg in Onderwijs en Vorming (AKOV). (2010). *Ontwikkelingsdoelen en eindtermen voor het gewoon basisonderwijs. Informatie voor de onderwijspraktijk*. Brussel: Vlaams Ministerie van Onderwijs en Vorming.

[14] Decin, G., e.a (2007-2008). *School of Education-project. De nieuwe didactiek multimedia*. Niet-gepubliceerd rapport, KHLeuven.

[15]Laevers, F. (2006). *Kijkwijzer voor een Procesgerichte Analyse van Onderwijsleersituaties.* [Monitoring system for a process-oriented analysis of learning situations in education]. Leuven: Centrum voor Ervaringsgericht Onderwijs.

[16]Laevers, F. (2001). *Procesgericht kindvolgsysteem voor kleuters. Toelichting bij de competenties*. Leuven: CEGO Publishers.

[17]Aifoon vzw. (2008). Visietekst. In *Aifoon*. Geraadpleegd 18 mei 2011, http://www.aifoon.org